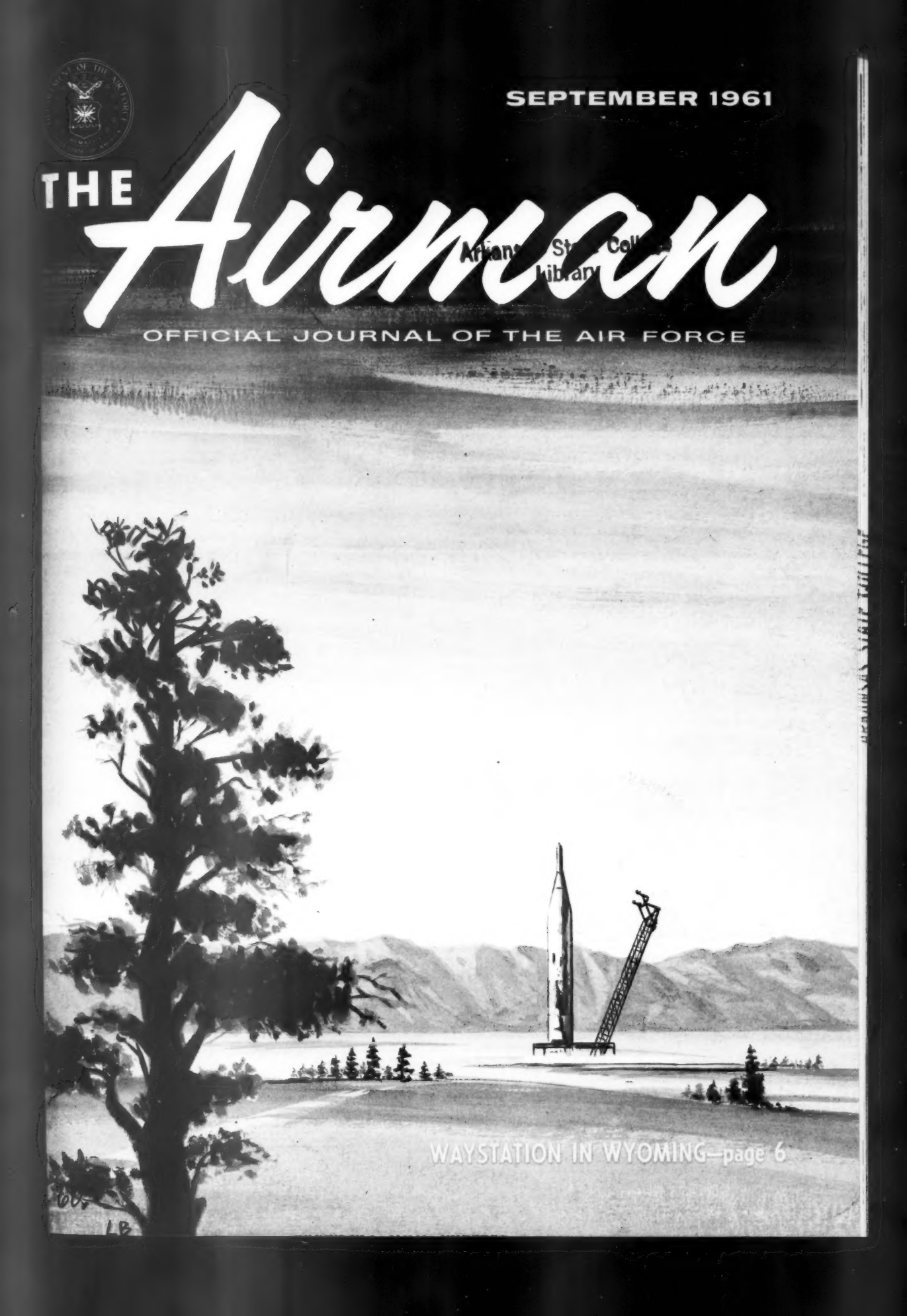
SEPTEMBER 1961
THE Airman
OFFICIAL JOURNAL OF THE AIR FORCE
WAYSTATION IN WYOMING—page 6

"You sure we're s'posed to catch this *one, Skipper?"*

The cartoons appearing here introduce a new series which will appear in THE AIRMAN monthly. Their creator is 1st Lt. Gary Smith whose Air Force career has been as successful as his cartoons. He enlisted in 1950, obtained his commission via OCS in December 1956, and trotted off to Florida State University where he earned a degree in meteorology through the Institute of Technology. Until last month he was a weather forecaster with the 9th Weather Squadron at Castle AFB. He is now attending UCLA, again under the IT program, working toward a master's degree in astronautics. He comments that he will probably be the best educated cartoonist in the Air Force.

"Don't unpack, honey . . . this job doesn't look too *secure!*

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

VOLUME V, Number 9 September 1961

Director of Information, Office of the Secretary of the Air Force, Maj. Gen. ARNO H. LUEHMAN. *Chief, Internal Information,* Col. ROGER B. PAYNE. *Editor,* Lt. Col. HARMON H. HARPER. *Assistant Editor,* Maj. ROBERT J. FLANAGAN. *Managing Editor,* TED R. STURM. *Departmental Editor,* SMSgt. HAROLD E. BAMFORD. *Art Director,* SMSgt. LESTER B. BOUNDS. *Production and Distribution.* RUSSELL M. WOODS.

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SUBSCRIPTIONS

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THE AIRMAN is primarily a medium for the exchange of ideas and information among Air Force personnel. Readers are encouraged to submit articles, short subjects, photographs, and artwork. All contributions will be given consideration; suggestions and criticisms are welcomed. Opinions expressed by individual contributors do not necessarily reflect the official viewpoint of the Department of the Air Force. All photographs are official USAF photos unless otherwise designated.

LETTERS TO THE EDITOR

Thank You

Sir: THE AIRMAN continues to be a wonderful example of timely Air Force reading. Colonel Bivins' article, *Read Your Commission* (June '61), ought to be framed and hung over every officer's desk as a reminder when apathy and lack of enthusiasm rears its undesirable head. We must rejuvenate our American patriotism, valor and fidelity as an example for all Americans to follow. We can all be proud of the quality of the writing in THE AIRMAN.

Maj. Burton T. Poole
Plattsburgh AFB, N. Y.

★ ★ ★

Recruiting Plea

Sir: We of the Enchilada Air Force (New Mexico Air National Guard) could use additional "blow-torch" pilots. Some of our heads are getting a "skosh" old, bald, and decrepit. We could use fighter jocks with a lot of jet time and youth—like 20 to 27 years of age. We want fighter pilots who fly because they love to fly. We have F-100s, are Air Defense, 24-hour alert, committed as of 1 July 1961. The flying is steady. The pay is good. We still have 20 mm., and fire on both dart and banner. Those interested can contact me for further details.

Maj. Fred J. Fink
Kirtland AFB, N. Mex.

★ ★ ★

Good Reason

Sir: Inside the front cover of the June issue of THE AIRMAN, you have an excellent picture of the United States Air Force Academy Cadet Wing. However, the majority of them are hatless. Can you explain why?

TSgt. Bobby Haley
Ft. George E. Meade, Md.

Sir: How come so many of the Cadets are uncovered?

SSgt. Alfred Richard
Blytheville AFB, Ark.

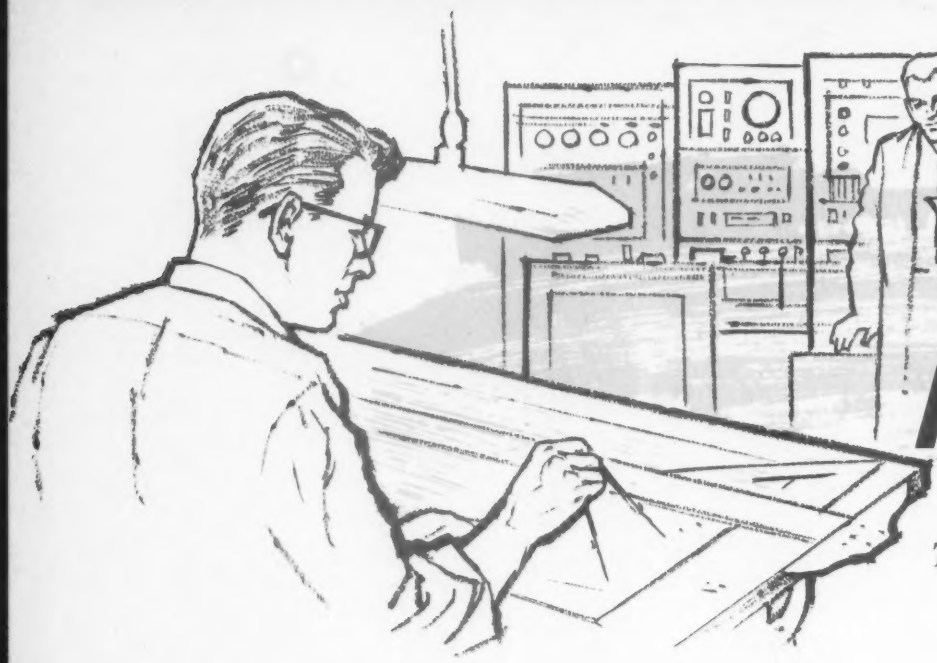
Sir: Isn't this a violation of basic military law?

A2C Paul A. Zomnir
Lowry AFB, Colo.

● *The scene in question is of the swearing-in ceremonies for the USAFA Class of '64. Unfortunately, at the time the photo was taken, uniform hats had not yet arrived at the Academy. Any commander, however, can authorize deviations from uniform requirements because of local circumstances.*

★ ★ ★

(Continued on page 36)



From COEP

The mission of Aerospace Corporat

THE MISSION of Aerospace Corporation is a broad one. Working with the Air Force, the corporation takes part in planning advanced missile and military space systems, directs and supervises their development, and participates in test launchings. In effect, Aerospace Corporation's responsibilities range from the idea or concept in the mind of the scientist through the countdown at the missile range to successful demonstration of the system.

Aerospace Corporation was incorporated under the laws of the State of California on June 3, 1960.

The establishment of the corporation was predicated on the need of the U. S. Air Force for top scientific and engineering competence to provide advanced planning, general system engineering, and corresponding technical direction or supervision of advanced ballistic missile and space programs. To assure objectivity in all its relations with government and industry, the corporation was established as a not-for-profit, public-service institution.

The concept represented by Aerospace Corporation was recommended in the "Eleventh Report by the (House) Committee on Government Operations," based on a study by the Committee's Military Operations Subcommittee and dated September 2, 1959.

Shortly after, the Secretary of the Air Force requested a management study committee headed by Dr. Clark B. Millikan of the California Institute of Technology to review the management of Air Force ballistic missile and space systems programs. The committee recommended establishment of a new non-competitive organization to replace Space Technology Laboratories, Inc. in providing assistance to the Air Force in the management and direction of missile and space programs.

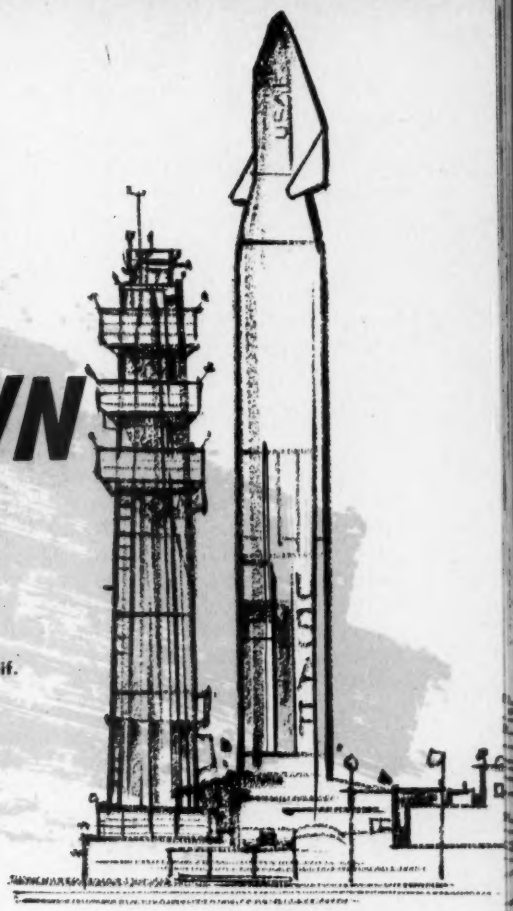
This is how Aerospace Corporation was born. Headquarters for the new organization were set up in a modern research and development center located in El Segundo, Calif., adjacent to Los Angeles International Airport.

Technology advanced by leaps and bounds after

Mr. Whitcraft joined the Aerospace Corporation as Director of Government Relations in August 1960. He previously headed the Western District Office of the Defense Systems Department of General Electric Co.

From August 1956 to January 1957, on a leave of absence from G.E., Mr. Whitcraft served as a consultant to the House Appropriations Committee (Nugent Group) on a three-man inquiry into the overall guided missile program of the Department of Defense. A major in the Air Force Reserve, he served on active duty from 1945 to 1955.

...EPT to COUNTDOWN



...rporation

by D. D. WHITCRAFT, Jr.

Director of Government Relations,
Aerospace Corporation, El Segundo, Calif.

World War II. Designers and builders of aircraft and missiles were coping with systems far more complex than ever before. The Air Force recognized that new and improved management methods should be formulated if its ballistic missile program were to proceed at the urgent pace required for national defense. To assist in the management of ballistic missile projects, the Air Force in 1954 utilized a new approach—a private contractor as a system engineer and technical director over numerous associate contractors.

Development of the required missile systems sooner than anyone had dared hope, and performance that exceeded the original design specifications, proved the basic soundness of this new technical management approach.

However, by 1959 it appeared that perhaps refinements could be made in the Air Force's technical management approach. The organization providing the technical assistance was owned by a profit-making firm. Industry—those companies which sought the job of building missile and space systems and subsystems—questioned the objectivity of the Air Force's systems engineer.

Objectivity in this case means absolute fairness and impartiality in dealings with both the government and industry. Recommendations concerning contract awards, for instance, must be based solely on contract bidders' competence to handle the job. No personal financial interest in the job should sway the systems engineer's decision. It was because the system engineering organization was owned by a profit-making corporation—which conceivably could wield influence for its own benefit—that industry at large was moved to object to the privilege of a potential competitor.

To safeguard objectivity, it was decided to form a not-for-profit organization, with no stockholders to appease or dividends to earn—an organization whose only reason for being was to serve the government, an organization in which every U. S. taxpayer was a "stockholder." As a further step in assuring objectivity, the organization would engage in no manufacture or production. This organization is Aerospace Corporation.

Aerospace Corporation performs its work under contract with the government—principally the Air Force. Its technical work is divided into three main categories of effort: systems research and planning, technical program operations, and laboratory operations.

The scientists and engineers engaged in *systems research and planning* channel their talents to planning for ballistic missiles and space systems, working as a team with the Air Force. This effort is devoted to assisting the Air Force in conceiving advanced weapons and military space systems and preparing initial general specifications. Included in this effort is the technical evaluation of proposals submitted by industry for such new systems. The objective for this operation in essence is the translation of military requirements into concepts of military systems to fulfill those requirements. This is

called advanced systems analysis, planning and initial systems engineering.

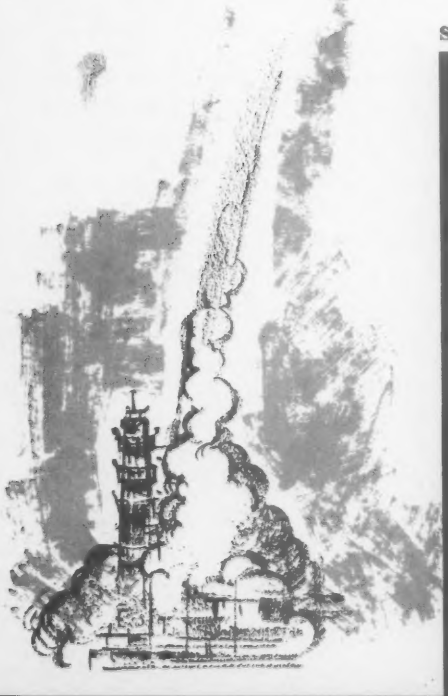
In the area of systems research the corporation is currently conducting study projects related to advanced ballistic missiles, orbital interceptors, manned satellite maintenance vehicles, low-cost space launching systems and recoverable satellites, and is conducting other studies involving advanced technology.

Technical program operations take over where system research and planning leaves off. Supposing for example, that initial systems-engineering efforts have resulted in a concept of an advanced satellite system for which the Air Force has a requirement. So the concept can be converted into hardware, contracts have been awarded to industry to build the system. Technical program efforts are directed toward assisting the Air Force in the technical management involved in the actual development of the space system. In most cases, Aerospace Corporation performs what is called general systems engineering.

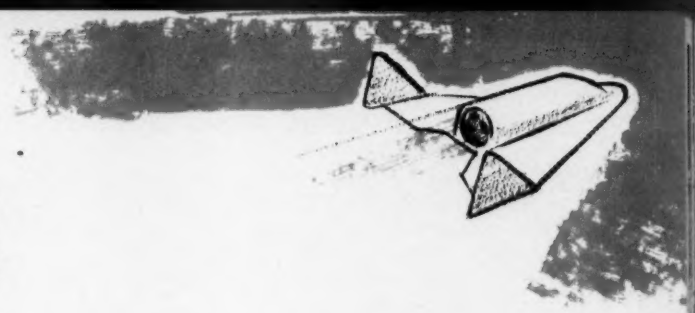
This might be the time to discuss briefly what is meant by systems engineering. Basically it concerns the operations involved in developing a complex system usually requiring the integration of a number of relatively complex subsystems, each of which may concern a different branch of technology. General systems engineering, that portion of systems engineering which Aerospace Corporation performs, deals with the overall putting together of a system. It involves design compromises between subsystems, such as deciding that the engines must be bigger because the payload cannot be smaller, or that the payload must be smaller because the engines can't be larger. Analysis of subsystems seeks to find if anything can give to make the system better, cheaper, or more reliable. Recognition and definition of how the subsystems fit together to form a whole system constitutes a part of the process as well as supervision of system testing. All these are conducted to the extent required to assure that system concept and objectives are being met in an economical and timely manner. In order to fulfill its general systems engineering responsibilities, the corporation technically directs the associate contractors working on the programs.

Detailed systems engineering, the actual detail work of engineering the system, is normally the responsibility of the industrial contractors. Aerospace Corporation does not intend to get into the detailed systems engineering, although it is ready to lend assistance to the contractor when required. It may be given responsibility for detailed systems engineering in special cases where approved by the Secretary of the Air Force.

Among the programs for which Aerospace Corporation is performing general systems engineering are: the satellite rendezvous and inspection system nicknamed *Saint;* the booster for *Dyna-Soar,* the manned hypersonic space glider; the *Atlas* booster used in NASA's *Mercury* man-in-space project; the launching and final stage vehicle for the Army's *Advent,* a communications satellite system; the *Thor-Ablestar* booster used in the Navy's *Transit* navigational satellite program; and for orbital interceptors, a research program concerning system concepts for destroying a ballistic missile during launch.



Senior project engineer, Harry Goldie, checks a point by phone during con



At Aerospace Corporation, *laboratory research operations* are conducted in two general areas:

1. Research and experimentation aimed at assisting the corporation in its systems research and technical program operations; and advancing the state of the art in areas critical to achieving continuing scientific progress.

2. Applied research program management to assist the Air Force in the management of its applied research programs being performed by industry under Air Force contracts.

The corporation is involved currently in a number of laboratory research projects. Chemical, nuclear, and electric *propulsion* are being studied. In the field of *aeromechanics,* study work is under way concerning winged and ballistic reentry configurations; simulation of hypersonic flight conditions using a hypersonic shock tunnel; arc tunnel experiments to measure heat transfer rates of various materials which might be used for reentry applications; and ionized gas studies. In *materials research,* investigations are being made into solid state physics, materials, structures, and environmental effects on materials. In *electronics,* research is being conducted in advanced solid state circuits for space communications and detection systems, research in electromagnetic and communications techniques, and in attitude and position sensors and controls. In *space physics,* the corporation is performing studies of the atmosphere, the radiation belts, and solar and stellar radiation.

As the foregoing indicates, during the first few months of its existence, Aerospace Corporation has become deeply involved in the nation's missile and space programs. In April 1961 the total staff reached 2,300. Forecasts indicate the total will rise to the neighborhood of 3,000 scientific, engineering and supporting personnel by the end of the year.

General Bernard A. Schriever, USAF Systems Command (AFSC) commander, before the reorganization of the Air Research and Development Command, commented on the urgent need for such a reservoir of trained personnel:

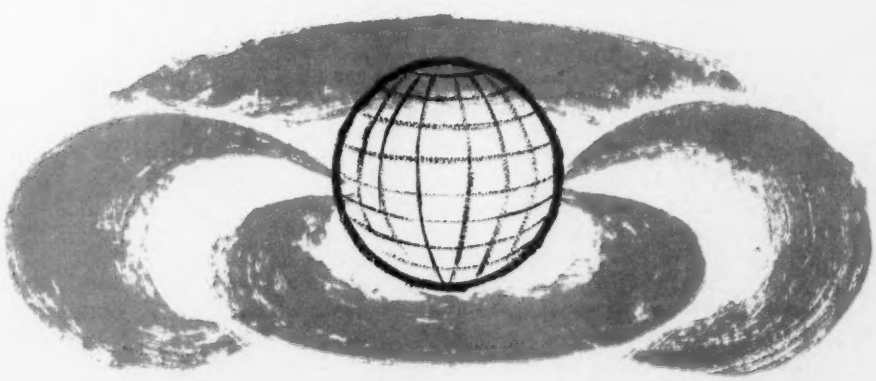
"I am frequently asked, 'Wouldn't the Air Force prefer to handle the integration of systems itself as an in-house job?' I do not want to minimize the outstanding contributions made by our Air Force engineers and scientists in our own laboratories . . . but the expanding budget for research and development and the sharply accelerated growth in our requirements . . . has forced us to enlist the aid of companies such as Rand, Aerospace, Mitre Corporation, and others. . . .

"When we add to it the further need for integration of the best industrial contractors we can find, the magnitude of the problem facing the Air Force today becomes clear. We simply do not have, internally, all the manpower resources necessary to carry out the technical management of all our programs.

"We do not, however, lack competence within the Air Force to manage complicated technical programs. We do have this managerial competence. We will continue to have the capability for technical management, and will continue to expand it. . . .

"However, the total requirement for personnel of this kind throughout the Air Force far exceeds the number of people we now have or can hope to get. There will be continuing need to employ objective organizations which can provide the Air Force with additional technical competence. Aerospace Corporation has an essential part in our long-range planning."

ing "Dyna-Soar" engineers.



Waystation in Wyomin

Once horses outnumbered men at Warren AFB. Today, hayburners are rarer than practice launches at SAC's first operational ICBM base.

by TSgt. JAMES R. DOHERTY, Hq SAC
(Photos by SMSgt. Wm. E. Lummus)

SPRING COMES SLOWLY TO WYOMING. It was mid-May, but a blanket of snow—measuring 11.5 inches at Cheyenne's level curbstones—was stacked blockhouse-high in the wrinkles of the prairie. The stuff was pretty, if you go for albino landscapes.

In the high places, however, where the sun and wind had gotten in their licks unhindered, the range was green. Every mesa for miles hosted its handful of cows, warming their backsides in the brightness. And on the horizon, whiter than the drifts themselves, the refrigerated Rockies sawtoothed the sky.

"It's a view and a half, wouldn't you say?"

I turned. The speaker was 1st Lt. Jason F. Mayhew, age 25, who was massaging his spine in the seat behind me. Mayhew, I'd been told, was a graduate of the U. S. Naval Academy, class of '58.

"Concur," I said.

Our G.I. bus snorted around a gentle curve in Highway 30. Just ahead a signpost proclaimed that Site Four, an ICBM suburb of Warren AFB, lay some distance off the road to our left. We turned and began climbing. The blacktop lane was bordered with pines. It was a tolerable view, to be sure, but I had work to do. I card-filed the scenery and concentrated on Mayhew.

"You're a graduate of Annapolis. Yet you chose a career in the Air Force. How come?"

From the lieutenant's ready reply, I gathered the question was nothing new.

"Easy," he said. "Sea duty. I don't like it."

"So?"

"I'm an engineer. When the Air Force offered me a crack at missiles—with no waiting, mind you—I jumped at it."

"Unusual, wasn't it? Your decision?"

Mayhew grinned. "I wouldn't say that. There are 32 of us on the base. USNA types, I mean."

"All launch control officers?"

"Right," Mayhew replied. "And all of us in the *Atlas* program."

Just then we rolled to a stop in front of a chained and padlocked gate. A cyclone fence stretched away to infinity on both sides. We had arrived. Beyond the barrier lay the first ICBM site in the United States designed to be strictly operational. But it is not the only one.

Nowadays, *Atlas* "coffin" launchers are landmarks throughout the middle west, not to mention the complex at Vandenberg AFB, Calif. But the one atop this Wyoming mesa was the first of its operational kind.

Warren AFB, located a stone's throw from downtown Cheyenne, boasts four such strategic "annexes." Each is an entity, complete with its own launch control and guidance centers.

Strategic Air Command, charged with the operational responsibility for *Atlas,* is touchy about pinpointing where in the cowboy state their big birds are nested. Suffice to say, none is more than 30 air miles from the gilded capitol dome in Cheyenne.

As we strolled into the blockhouse, Maj. Leon J. McGarry, Site Commander, briefed me on the shift change that was taking place.

"For the record, our launch and maintenance crews work a 12-hour day. Unofficially, it is more like 14 hours. The crew going off-duty must brief the one coming on. That takes a while. The bus ride back and forth to Warren tacks on more time."

We entered the blockhouse. I saw spotlessly clean corridors, opening onto antiseptic rooms jammed with electronic gear. My guide spelled it out for me.

Pad Chief SSgt. Augusta Murphy and A1C Fred Reed (on ladder) examine nose ring on "Atlas" at remote Wyoming site. The business end is tipped with Mark III nosecone.

"Everything necessary to get our birds in the air is located under one roof here. The big room at the end of the hall contains a few million bucks worth of launch control apparatus, plus the guidance center and computer. The mess hall is only a few feet away. Our food is prepared here, with the exception of baked goods. These are trucked out from Cheyenne. In an emergency, we can sleep half the crew. Our dormitory is complete with TV, lounge chairs, and the usual day-room paraphernalia."

We strolled into the launch control center. A field grade officer, skipper of the crew going off-shift, was briefing his relief. I listened. The major delivered a formal, concise rundown on weather, the status of maintenance, and the condition of all missiles for which he had been responsible.

He could have been the aircraft commander of a SAC combat alert crew. The scene might have been an alert shack on the end of a runway. But it wasn't. And the difference between what takes place on a "conventional" SAC base and what transpires on an operational missile installation was what I'd come to learn.

The process had begun at Warren's main gate. There, while I contemplated a few dozen acres of Wherry housing just inside the base boundary, an air policeman —whose visage radiated all the warmth of the Mendenhall Glacier—inspected my orders. He seemed downright disappointed when everything proved to be in order. I was waved through—reluctantly. Security, I concluded, is tight at Warren.

The base itself is a holdover from another century. Established in 1867, it was named in honor of a Union Army Civil War hero, Maj. D. A. Russell, who had died in action three years earlier. Troopers at the fort were assigned a rugged "peacetime" mission: protect employees of the Union Pacific Railroad Co. from attacks by hostile redskins.

On June 25, 1876, word of Custer's massacre by the Sioux was received at the fort a mere five hours after the tragedy occurred—a record for the times.

In 1930, Fort Russell became Fort Francis E. Warren, in memory of a former U. S. Senator and Governor of the State of Wyoming.

SAC took over from the Technical Training Command in 1958. Two strategic missile wings, the 706th and the 703d, were immediately established. Today, the units are designated the 389th and 451st respectively and are part of the Warren-based Thirteenth Air Division, under the command of Brig. Gen. William S. Rader.

The first *Atlas* missile arrived at Warren on October 2, 1959. As it was trundled past the line of weathered brick stables that marks the old main base, many a long-gone trooper must have turned over in his grave. It is this incongruous mixture of the new with the antique that makes Warren different.

On-base quarters are a case in point. In addition to several hundred Wherry units (functional, but ugly), Warren boasts some of the most attractive officers' housing in the Air Force. Most of it dates back to the

turn of the century, or before, but time has been kind. Dozens of the well preserved brick duplexes, classic examples of military-colonial architecture, line the Warren parade ground and look as permanent as the prairie itself.

Aircraft are conspicuous by their absence at Warren, and for an excellent reason. The base doesn't own a runway. Military planes land across town at an annex of the municipal airport. If the runways seem inordinately long—there's a good reason. Cheyenne's elevation is slightly above 6,000 feet.

The altitude gives housewives fits. Boiling an egg, for example, becomes an exercise in endurance. And until newcomers are acclimated, they are apt to find themselves perpetually short of breath.

The expanding base population is approaching the 5,000 mark. But, because Warren technicians are so widely dispersed, the old cavalry post resembles a well-groomed ghost town most of the time. In comparison, the conventional SAC base is one long rush hour.

Don't be misled, however. In places like the missile assembly building—located on the "modern" side of a tiny creek that divides the base—things are humming, around the clock. Here, under the watchful eye of Lt. Col. Bern Bonifant, the division's maintenance supervisor, teams of highly trained technicians perform their endless inspections on all assigned missiles.

Periodically, each bird is removed from the pad and returned to Warren's missile assembly building for inspection and overhaul. Colonel Bonifant, a pioneer in SAC's pilotless weapons program, maintains that there is "rarely a dull moment" in the life of an *Atlas* mechanic.

"Every day we run into new problems," the 46-year-old colonel is fond of saying, "for which new solutions have to be found. To us old airplane types—accustomed to going mainly by the book—it's tough sometimes. But it's refreshing, and a challenge we welcome and enjoy."

In a handful of rooms above Warren's missile assembly shops is the Thirteenth Air Division's combat control center. From here, by means of widespread and virtually foolproof communications system, activities at the division's various launching sites are monitored, supervised, and coordinated.

The set-up is the first of its kind in existence. On a series of six-foot-high panels strung across the front of a long rectangular room, the condition of all missiles and the duty status of each launching crew is displayed for the edification of the division controller.

During a rare tension-free half-hour, Maj. Max G. Thaete, who takes his regular turn in the control room, briefed me on the difference between his former job and his present one.

Duty controller Thaete, who skippered a B-29 during WW II, is 45-years old. A veteran of 18 years in the Air Force, he's been in the missile business since 1959. He is a bachelor—who will soon become otherwise.

"Like a lot of people," Thaete began, "I got into the missile business because I saw the handwriting on the wall—career-wise. I'm not sorry, although I loved flying. Still do. But missiles are the coming thing. Anyone who says otherwise is just not informed."

Facing the camera, Lt. James F. Mayhew, USAF, is a graduate of Annapolis 1958, and is one of 32 alumni of the Naval Academy now serving the Air Force in the "Atlas" program at Warren. In volunteering for missiles, Mayhew accepted challenge of "new technological fields."

"But compared to flying a SAC bomber, this duty must be rather tame," I offered. "Would you advise anyone else to make the switch?"

"I would and I have—often," Thaete replied. "As for this being 'tame' duty, it depends on what you mean. Personally, I find the duty stimulating. It's a challenge, and a big one. Admittedly, there is a lot of detail, some of it tiresome. But it's 180 degrees off from the aircraft thing.

"To keep abreast of procedures, we study constantly. Our knowledge has to be current and we've got to be ready instantly to apply what we know. We do some experimenting, understandably. After all, the thing we're preparing for has never happened."

"How would you characterize your present job?" I asked.

Thaete thought it over. "I guess you could call it hours and days of busy boredom, waiting for that moment of panic we hope will never come."

The control center's NCOIC is TSgt. Melville C. Livingston, a lanky 28-year-old South Dakotan who can look back on exactly one decade of Air Force service.

Livingston is a former aircraft controller with SAC's de-activated 43d Bomb Wing. Thirteen months ago, he elected to "convert to missiles." Nowadays, he bosses five NCOs who make up the control center's enlisted operations crew.

"The thing that appeals to me about all this is the feeling of permanency we have here," Sergeant Livingston opined. "It's not like a bomber outfit, where you pick up and go every once in a while. Sure, we get a lot of overtime. But you expect that and the newness of the work makes it bearable."

As he spoke, Livingston fiddled with the dials on a large multi-instrumented console in front of him. "Another thing I go for is the pile of communications equipment we're responsible for. For example, we've got direct lines, with a couple of radio system backups, to every site. In addition, we're tied directly into Fifteenth Air Force Headquarters and the SAC command post. It's quite a layout. A lot of work and headaches, at times, keeping it operational. But that's part of the 'challenge' you keep hearing about."

Sergeant Livingston sports a healthy tan. I judged him an outdoorsman.

"How's the hunting and fishing around Cheyenne?"

"The greatest," the NCO replied emphatically. "And you don't have to go far to find it. Believe it or not, last summer I landed a 20-inch rainbow in a creek that cuts across one corner of the base. As for game, I've hunted antelope, deer and elk." He knocked on wood. "I haven't been skunked yet."

Major Thaete, who was eavesdropping on our conversation, supplied the verfication. "He's one of the good ones," the officer remarked. Reluctantly, I switched the talk back to business. How, I wanted to know, did the operation at Warren differ from that at Vandenberg? And why all this talk about an operational "first" at Warren? Thaete had the answers.

"Admittedly, Vandenberg was in the missile business before we were. But, although they've an operational capability, their mission is primarily training. All of us here, for instance, received our *Atlas* 'OJT' on the west coast. One of our crews actually launched the first missile ever to be fired from a coffin configuration out there. But, again, it was a training maneuver, as opposed to an operational shot."

The officer paused. Sergeant Livingston leaned over to pass along a bit of intelligence. Something about a "down" transmitter at Site One. Major Thaete acknowledged the information. Then he made a statement I'll be a long time forgetting: "When the chickens fly the coop in Wyoming, Sarge, we'll be at war."

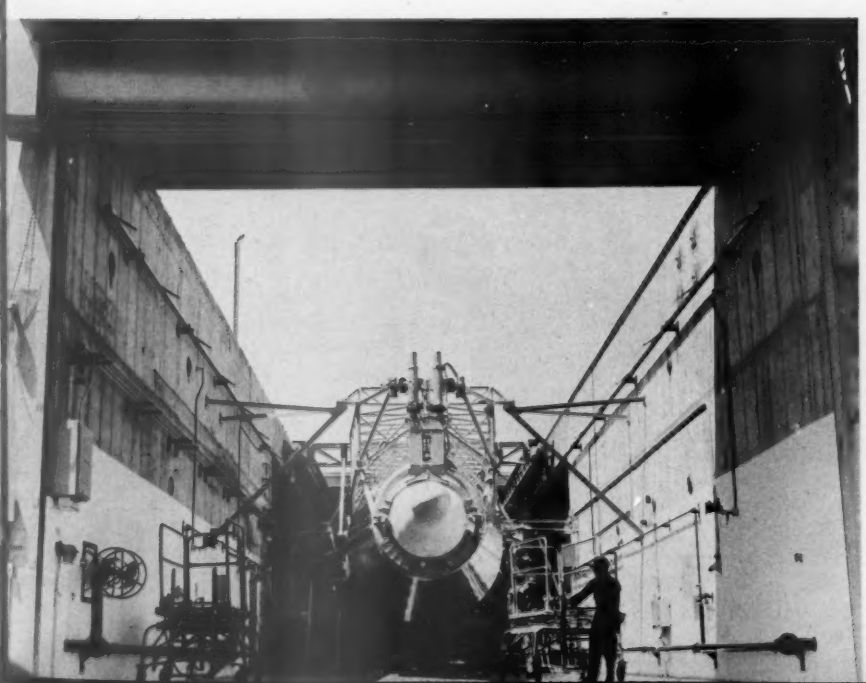
Next day, at Site Four, I discovered what Warren missilemen will be doing until war comes. There is nothing clandestine about their actions. They are frankly—and in a spirit of deadly earnestness—rehearsing without letup against the day of disaster.

It is a quiet kind of activity. There are no jet aircraft roaring in the background—although an occasional helicopter may visit the site to offload a team of inspectors or the always curious contingent of "distinguished visitors."

To the uninitiated, it might appear that nothing at all is taking place, most of the time. Alert watches are like that. You wait, then you wait some more. It applies, whether you're staked out alongside a runway, or lounging in front of a launching console in an *Atlas* blockhouse. Inevitably, men get bored. For if war is mostly waiting, waiting for war is worse.

With its morning briefing completed, Ready Operations Crew 3 took its place in Site Four's launch control center. Ten men, including the trio assigned to guidance, began a visual inspection of their respective consoles. I crossed the room and shook hands with Lieutenant Mayhew's boss, Capt. James H. Browning, launch control officer.

Captain Browning typifies the career officer who has chosen the pilotless way of life. Which is not to say, however, that he doesn't know his way around a cockpit. A glance at the 39-year-old's log book shows more



Head-on view of "Atlas" in its concrete coffin. This shows standard configuration for all "Atlas" installations in the U. S. Usually the roof is kept closed to protect the bird from the weather.

En route from factory to launch site, "Atlas" moves at a careful, deliberate pace over a snow-fringed road from Cheyenne airport toward Warren AFB.

than 1,000 hours spent "flying the hump" during WW II. In one 30-day period, his outfit lost 60 percent of its flying personnel and aircraft.

Browning accepted a discharge following hostilities. For the next five years he flew alternately for Eastern Airlines and the Borg-Warner Corporation. When the Korean War broke out he was attending Ball State College in Indiana.

Once again Browning found himself in the line of fire, flying C-119s with the Troop Carrier Command in Korea. Later, having found his way into SAC, he piloted B-29s and KC-97s. In July of last year he began his formal training in guided missiles at Sheppard AFB, Tex.

"From Sheppard we came directly to Cheyenne. That was in December 1960. Our crew was formed and we were ordered to Vandenberg for operational readines training.

"At Vandenberg we got our hands on the 'hardware' for the first time. A few hundred practice countdown later, we were declared ready and returned to Cheyenne Then, after all that, I was directed to take over thi crew. It was the biggest break I could have wished for."

Ready Operational Crew 3 is the team that fired the first coffin-contained *Atlas* down the Pacific Missile Range. Its members are justifiably proud of the fact. And small wonder. Only a handful of SAC's finest have had the privilege.

The date was April 22, 1960. After a picture-perfect launch, the bird flew 4,400 miles and plummeted "right down the pickle barrel." The event was an operational milestone in SAC. Needless to say, Ready Operational Crew 3 would love to try it again.

Unfortunately, the average daily duty tour at an operational missile site is rarely so exciting. After equipment has been painstakingly checked, the long wait begins. At least once during each 12-hour shift an alarm that is connected directly to SAC's underground command post sounds off. A tape recorder begins whirring. Next, a coded message comes crackling into the room through a loudspeaker that is never secured.

The matter-of-fact voice sets off a human chain reaction in Site Four's blockhouse. This is the dreaded signal for a countdown. Not until its near-finale, at a point where liquid oxygen and fuel would normally begin pouring into the bird, will anyone except Captain Browning and Lieutenant Mayhew know that "this has been a drill."

If the order to fire is ever given, it will be received in precisely the same manner. Then, after the endless hours of preparation and practice, the payoff is likely to be slightly anti-climactic.

Why? Because from their particular blockhouse Ready Operational Crew 3 will be firing blind. Unlike

Steering committee. Guidance team comprised of Lt. James R. Wade and SSgt. Joseph Utley can point with pride to performance record. Shot launched from Vandenberg AFB to a Pacific target area impacted dead center under their expert guidance.

the setup at Vandenberg, there are no television camera aimed at Warren launch pads. Should a liftoff ever occur, heaven forbid, it will go unobserved by the people most directly concerned. At best, theirs will be a vicarious thrill.

NCOIC of Ready Operational Crew 3 is TSgt. Cecil L. Holmes from Sparta, Ga. Holmes' official title: Missile Systems Analyst Technician (MSAT).

In point of service with pilotless weapons, the Georgian is the crew's veteran. His career in missiles began back in 1951, when he was assigned to a *Snark* project. Later, he worked on *Sidewinder,* the deadly little air-to-air missile that is now being carried as standard equipment on a number of Air Force fighter-interceptor models.

Holmes and his fellow airmen on Ready Operational Crew 3 have studied *Atlas* until they're blue in the face. And the schooling goes on and on. Frequent blockhouse classes, conducted by representatives of the manufacturer, punctuate their working days.

"We can't get too bored," Sergeant Holmes explains. "We just don't have the time."

Others on the crew, all of whom participated in the historic April 1960 launch, are SSgt. Everett M. Ward, Missile Engine Mechanic; A1C Kenneth D. Ryan, Missile Systems Analyst Specialist; A1C Wallace Snow, Missile Electrician; A1C Nujie Solieau, Missile Mechanic; and A1C George Klimas, a Missile Hydraulics Technician.

The crew's guidance officer is 1st Lt. James R. Wade, a West Pointer, class of '58. A self-styled "scope dope," Lieutenant Wade will figure strongly in the success of any shots from Site Four's isolated launch pads.

"From the moment of liftoff, the bird belongs to us," the officer pointed out. "Our equipment monitors the flight, tracks the missile, computes the trajectory and sends commands to the weapon on its way to the target."

How does Lieutenant Wade know where to aim? His top-secret instructions come from SAC's tightly guarded Trajectory Center at the command's Omaha headquarters. Upon receipt, the aiming formula is read into a computer. Minutes in advance of a launching, Wade and his cohorts have but to inject certain variables, such as current weather data. Nothing to it—according to Wade. He characterizes the entire bewildering process as "merely the complicated application of a simple principle."

Wade's assistant is SSgt. Joseph Utley, age 27, of Waynesboro, Ga. Utley formerly plied his trade in the darkened trailer of a radar bomb scoring unit. Like most of his enlisted colleagues at Warren, he attended electronics classes at Keesler AFB, Miss., followed by a period of cramming at Vandenberg's missile finishing school.

Guidance technicians—both commissioned and non-commissioned—are somewhat concerned these days about their future where *Atlas* is concerned. Later models of the bird employ inertial guidance systems that do their own thinking. For these and other reasons, the team of Wade and Utley is eyeing the research and development field more and more. Both proclaim that the equipment they know best would be "ideal" for satellite launches, with but limited conversion.

Prior to dispatch to the launch site, each incoming "Atlas" is subjected to minute testing at Warren AFB missile assembly building. SSgt. Gobel Thomas, NCOIC of the calibration section (foreground) and assistant SSgt. Richard Watts operate this booth crowded with missile automatic programming checkout equipment.

Many Warren missilemen are currently champing at the bit for a chance to work on more advanced ICBM systems, like *Titan* and *Minuteman.*

If more experienced aircraft crew members are afforded an opportunity to train in newer aircraft, they ask, why should not the same privilege be extended to the most experienced missilemen? The question gets a lot of attention during lulls in activity at Site Four's blockhouse.

How long Ready Operational Crew 3 will be together is anyone's guess. Several of its members are toying with the notion of accepting discharges when their present service commitments expire. But you get the impression they won't. They're a team — and they'd prefer to remain that way.

On the way back to Warren from Site Four, it occurred to me that out here, in a land that still smacks of the frontier, a new kind of pioneering is going on. And the incongruity is fascinating.

It's the Air Force, but there are no aircraft in evidence. These are airmen, but with their feet firmly on the ground. And there will be no sound of engines ever—until the big "going out of business day" finally arrives.

One shot from each pad. No long chase across the plains, no reloading. Just fifteen minutes — or less — then close up shop.

In the meantime, Warren missilemen wait — and work. For they're bound by an unspoken obligation: to do right the first time the thing they're trained to do.

There will be no second chances.

EDUCATIO[pa

by
1st Lt. CARROLL S. SHERSHUN
Airman Staff

WHEN Roy Krebs received his bachelor of arts degree from San Francisco State College last January it marked the end of a 10-year quest—but it was just the beginning.

Roy's diploma was more than something to frame and admire. It was his passport to tomorrow. With it he had become USAF's first airman to qualify for the Officer Training School phase of the new Airman Education and Commissioning Program.

Then on May 9, the former staff sergeant's wife and their three young children smiled with justifiable pride as he was commissioned a second lieutenant.

Lieutenant Krebs started his college studies at Harvard in 1950. Joining the Air Force in 1954, he continued his interrupted education by attending Bethany College extension courses at Schilling AFB, Kans. He earned sufficient credits to qualify for full-time studies at San Francisco State. There his outstanding academic performance enabled him to complete degree requirements a full semester earlier than the average student.

At Lackland AFB, Roy's performance in OTS earned him top academic honors for his class and distinguished graduate status. The latter qualified him for augmentation in the Regular Air Force. Now attending USAF's Intelligence School at Goodfellow AFB, Tex., he's destined for increasingly important assignments and responsibility.

Lieutenant Krebs' story, once unique, is fast becoming typical of many throughout the Air Force.

Then there is CWO Katherine Dillon who didn't have an hour of college credit when she joined the WAF. In June 1960, she graduated with first honors and received her A. B. from the University of Maryland, where she majored in history. Now assigned to the Pentagon, she has completed half of her master's degree requirements. All of her credits have been earned by off-duty study.

MSgt. Lloyd W. Puckett recently received a high school diploma he had deferred for 40 years. The 56-year-old airman studied at the F. E. Warren AFB, Wyo., education center for more than two years. He is now on duty in Japan.

SSgt. Joe E. Holbrook of Griffis AFB, N. Y., graduated from the University of Omaha in June with a bachelor of general education degree. A career airman with seven years' service, he majored in German and aspires to teach in USAF schools. Sergeant Holbrook qualified for his B. S. by taking part in the off-duty education program, earning college credits from Morehead State College, Indiana University, Utica College, Mohawk Valley Technical Institute, USAFI, and the University of Maryland. He has now been accepted for graduate study at Syracuse University.

The list runs into the thousands.

A Big Program

Just how extensive is the education services program in today's Air Force? A look at the statistics may surprise you.

During 1960:

☆ There were 136,626 enrollments in civilian col-

passport to tomorrow

lege and secondary school classes on or near USAF bases. Most were in evening classes.

☆ Another 118,850 enrollments in on-base ECI (Extension Course Institute) and USAFI (U. S. Armed Forces Institute) group-study classes.

☆ USAFI correspondence courses recorded 58,553 new enrollments.

☆ ECI mail-order courses reached an all-time high in excess of 370,000 enrollments.

☆ Airmen enrolled in 19,081 elementary level courses.

☆ 41,293 airmen took high school GED (General Education Development) tests, while 28,555 tackled the college-level test battery.

☆ 1,079 airmen earned college degrees. Of these, 523 completed degree requirements during off-duty time. The remaining 556 received final semester TDY "Bootstrap" assignments.

☆ High school diplomas or certificates of equivalency were earned by 14,193 airmen. Elementary certificates were awarded to 2,869 others.

Education within the Air Force obviously has become an important program. So important, in fact, that the total cost in appropriated and nonappropriated funds topped $3.3 million last year. Tuition assistance alone exceeded $2.1 million, and this year it will probably go higher.

Education—An Investment

Why all this stress on education? In the first place, it is no super-benevolent fringe benefit. The USAF is getting, and will continue to get, significant returns on such a substantial investment. These returns are in the form of professional, highly trained personnel for whom modern weapons technology has created a demand that far exceeds the supply.

Advanced military techniques and complex equipment require unprecedented numbers of people with formal education. Gone forever are the days when all the academic knowledge a navigator needed was a basic understanding of math.

As Dr. Bowen C. Dees, Assistant Director of the National Science Foundation, said while addressing the symposium on Long Range Air Force Qualitative Education Requirements:

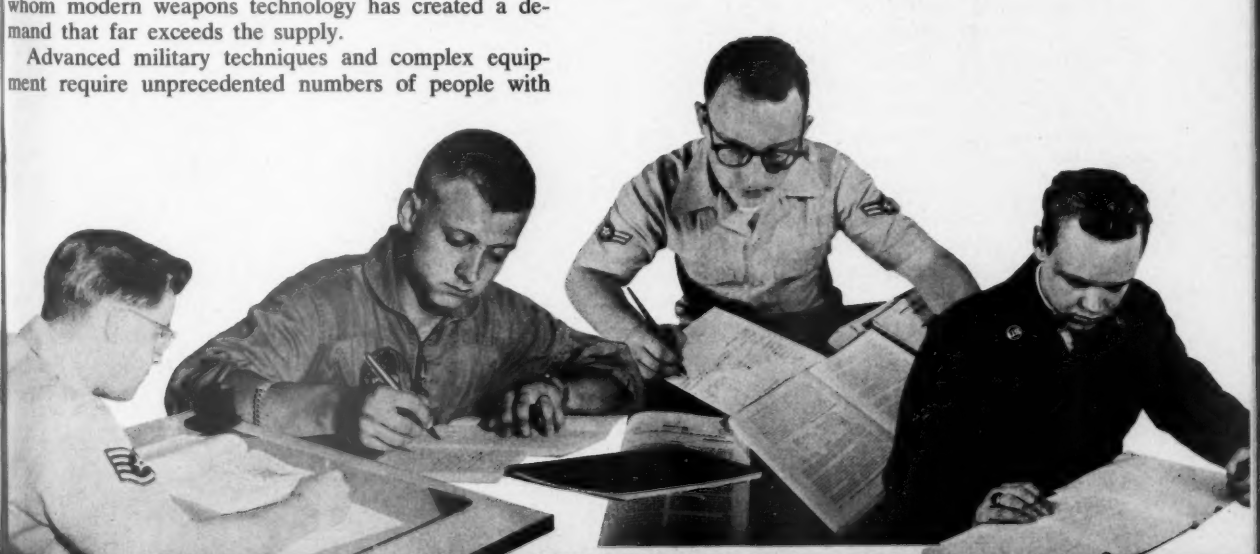
"The United States has now passed the point of no return . . . relative to its continuing and increasing reliance on science and technology for economic well-being . . . and for national defense."

Dr. Dees stressed the need for "broadly-educated individuals—people who can combine scientific, technological, economic and military expertise—as essential to the adequate functioning of an up-to-date military service."

Thus major emphasis is being placed on training in the natural sciences, engineering, and mathematics. Most Air Force dollars are being spent directly for those whose studies will bring USAF the greatest return on its investment.

All but 32 of last year's 200 Airmen Education and Commissioning slots were awarded to individuals pursuing degrees in engineering or science. Similar emphasis characterizes the Air Force's Institute of Technology (IT) program. Temporary duty limits under "Operation Bootstrap" have been extended from six months to a full year for those seeking degrees in science and engineering.

Although science is emphasized, the humanities are not neglected. They, too, meet specific Air Force needs, one of which was perhaps expressed best by Gen. Thomas D. White, former USAF Chief of Staff:



"Today's airmen, surrounded by conflicting ideologies and propaganda, must have sufficient education to provide them with insight, vision, and self-confidence to defend the principles of American democracy in time of stress. Members of the Air Force are given the best education and training possible so that they can resist enemy indoctrination either at the present time or in future conflicts."

The dividends from the USAF's investment in education are not confined to the Air Force by any means. Equally important is the stake which the Department of Defense has in contributing to America's future. No national resource is more important than our people; no project more vital than development of the overall store of knowledge.

The Pay-Off

By 1975—just 14 years from now, a tomorrow that is not so far away, the population of the United States is expected to total about 221 million.

A barometer of the increased importance of education is reflected by soaring college enrollments. By 1970 there will be three million more college graduates in America than today—and 20 million more high school graduates.

What does this mean to you as an individual?

Basically it means the more schooling you get, the more dollars you earn.

Take a man during his peak earning period, 35 to 54. Chances are better than two out of three that he's earning $6,000 or more a year—if he's a college graduate. Among high school graduates the chances are one in three.

That American education is an investment which pays off handsomely is obvious from the following U. S. Department of Commerce table:

Years of school completed	Median Income
Less than 8 years	$1,905
8 years only	3,214
1-3 years high school	3,594
4 years high school	4,548
1-3 years college	4,924
4 years college	6,374
5 or more years college	6,926

Returns on the educational investment can be even more dramatically presented when they are calculated in terms of lifetime earnings. The estimated lifetime income of a man with only eight years of schooling is $116,000. For a man with 12 years, it's $165,000. And for a man with four or more years of college, it's $268,000.

Look at it another way. A high school education adds about $50,000 in lifetime earning capacity over the person with only an eighth-grade level. College adds $103,000 more.

The Future Picture

While these earning averages are based on predominantly civilian incomes, the opportunity ratio for military advancement is equally impressive.

USAF's education levels are moving upward. Over 80 percent of all enlisted personnel now have high school diplomas, compared with barely over 60 percent five years ago.

An Education Advisor explains course requirements to an interested WAF at Maxwell AFB. Hers was one of 58,553 enrollments processed by USAFI last year.

It has been five years since the USAF Education Conference established minimum education goals of a high school education for every enlisted man and a college degree for every officer. Many officials now feel that top-level NCOs should have two years of college work to keep pace with increasing requirements.

By 1965 only 2.5 percent of USAF's total enlisted force is expected to possess less than a high school diploma. Of the 97.5 percent who are high school graduates, 16 percent will have some college; 8 percent will boast 2-4 years college, and 1.5 percent will have earned bachelor's degrees.

Within three years the combination of selective recruiting and special study classes should result in absolutely no airmen with less than a grammar school certificate. At present an estimated 8,000, about one percent of the enlisted strength, are in this category.

Approximately half of all USAF officers now hold college degrees. Educational opportunities plus current commissioning policies will reflect a strong upward trend in the proportion in the next few years. Most new officers, those entering USAF by the OTS and ROTC routes, hold degrees.

It should therefore be apparent that prospects for advancement will be best for those who don't ignore the need for increased and continued learning.

Then too, looking ahead to retirement or separation, what are your prospects for better job opportunities? Even most career airmen will spend less than half of their wage-earning years in uniform.

The population boom will bring with it increased demands for job opportunities. By 1970 alone we'll need 14 million more jobs than today. Competition for those jobs will be keener.

Even now unemployment is a major problem. The jobless rate among the poorly educated and unskilled citizens is by far the highest of any group. Unemploy

ment is twice as high among those who dropped out of high school as those who finished. Lack of education and inadequate training are by far the basic causes of joblessness.

TSgt. Alfred Skey of Williams AFB, Ariz., recently received his master's degree in psychology at Arizona State. He measures one immediate value in these terms:

"Without the Air Force I couldn't have received this education. To obtain a master's in psychology it would cost the average person $7,000 to $8,000. I've done it, with USAF's help, for about $500."

For Sgt. Skey and others the reward also comes in greater understanding—a deepening of their knowledge of the world they live in; the broadening of cultural interests; a new challenge for intellectual powers.

How successful has the Air Force education program been?

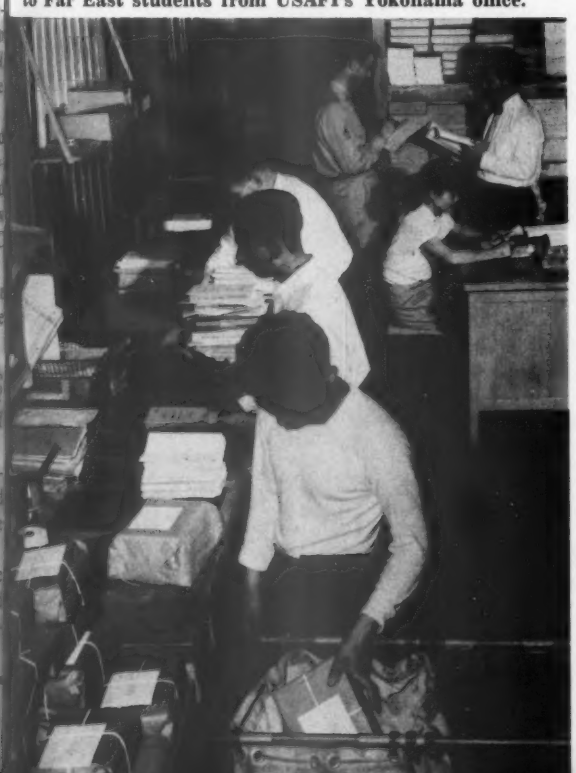
In 1949 only 9,561 attended off-duty civilian school classes, compared with 136,626 enrollments last year.

Since 1955 over 5,000 airmen and officers have earned college degrees.

At times the program has been too successful. ECI courses proved so popular that at one point during the past year all new enrollments had to be temporarily suspended due to the heavy demand for course materials. Increased emphasis on educational training as a factor in promotions, assignments, and other actions caused more students to apply than ECI could handle. New enrollments have risen steadily from 83,000 in 1957 to over 370,000 last year.

During 1960 two out of every three—65 percent—of all SAC military personnel took part in some phase of the education program. If was a spectacular increase over the 1959 record of 35 percent participation.

Course materials are assembled and mailed direct to Far East students from USAFI's Yokohama office.



USAF's Aims

Dr. James T. Robison, USAF's Education Services chief, outlines the program's aims as follows:

"We make a substantial effort, within fiscal and manpower limitations, to provide opportunities for:

1. "All personnel to raise their educational levels to develop to the maximum their potential skills and abilities essential for the support and operation of our modern weapons system;

2. "All personnel to meet the desired Air Force current and projected educational requirements in all areas of study;

3. "Selected personnel to meet the prerequisites for highly specialized programs at both the undergraduate and graduate levels, and

4. "Selected personnel to obtain degrees in science, engineering, and other specialized fields where shortages exist."

Simply stated, this means that regardless of a person's educational level upon entering USAF, and regardless of the location of his duty assignment, he can increase his academic and vocational education. To help him do this an entire network of Education Services offices have been established.

A total staff of 19 officers, 482 enlisted personnel, and 346 civilian education officers perform full-time duty, principally at base level. These are the persons who provide the counseling, information, testing, processing, and funding requirements for various programs.

The Air Force encourages all personnel, regardless of rank, to continue their academic education while in the military service. There are two basic kinds of educational programs:

A Professional Education and Training Program, of many types and parts, which is designed to meet specific determined skills and functional requirements. This is dominantly an on-duty program, and participation is by assignment.

An Education Services Program, also of many types and parts, which was established in order that Air Force personnel on extended active duty, regardless of rank, might be provided the opportunity during off-duty time to continue their academic and career education. Participation in this program is wholly voluntary and is accomplished primarily on off-duty time.

Among the many education programs available to Air Force personnel and some of their main features are the following:

USAFI Correspondence

Over 200 courses available in elementary, high school, college and vocational-technical subjects. An initial fee of $5 is charged, after which there is no additional cost as long as satisfactory progress is maintained.

More than 6,400 other correspondence courses are available through USAFI from the extension division

MSgt. Arvin Wells leads Williams AFB fire-fighters in a snappy question-answer session during an ECI course class.

of 44 leading colleges. These are offered at reduced prices. (See AFP 5-2-1.)

ECI Correspondence

ECI offers over 100 courses based on instruction given at USAF resident schools. They are designed solely for Air Force personnel to further their professional training.

General military courses include OCS, Squadron Officer School, Command and Staff School, and the Air War College. Many younger officers fulfill their Squadron Officer School requirement through ECI in lieu of actual class attendance. Specialized courses are offered in 27 career areas ranging from intelligence through radio and electronics to personnel and legal fields.

Credit is given for some of the training toward the formal requirements for a new AFSC. For some skills the ECI course carries the same weight as completing a formal school. It does not mean, of course, that the student automatically gets a new AFSC on completion. But he will undoubtedly be in a better position to pass the required skill test and meet other requirements. There is no charge for ECI enrollment.

Group Study Classes

Education officers organize on-base group study classes using both ECI and USAFI materials. Qualified instructors teach these classes, most of which meet at night. In addition to being able to go over course materials together, group study classes are generally able to obtain additional materials, films, texts, or visual aids not available to individual students.

Civilian Schools

A total of 401 colleges provide night classes on or near USAF bases. Full residence degree credit is awarded by 90 percent of these schools while the remainder grant extension credit.

Full degree credit classes are offered on bases in all overseas commands. The University of Maryland, offering the most extensive program, recorded 7,130 enrollments last year. Maryland classes are conducted in Europe, North Africa, the Near and Far East, and North Atlantic areas. Students in the Canal Zone and Puerto Rico attend Florida State University classes. Other overseas airmen study at the University of Hawaii, University of the Philippines, the Territorial College of Guam, and at Sophia University in Tokyo.

Technical and high school off-duty instruction is also provided by 124 secondary schools.

Tuition aid, up to $7.50 per semester hour, is available for off-duty civilian school attendance. Additional financial grants and loans, such as those offered by the Student Union at Tachikawa AB, Japan, and the Air Force Logistics Command scholarship program, are made by some bases.

Operation Bootstrap

"Bootstrap" provides tuition assistance, final semester and final year temporary duty for civilian school attendance.

Airmen can attend college on TDY with regular pay and allowances for up to six months to complete bachelor or graduate degree requirements. A new final year TDY program is available to those who can complete USAF requirements in science, engineering and other specialized areas. Those authorized final semester or final year TDY must pay the costs of tuition, registration fees, books and other supplies. TDY travel is also performed at the individual's own expense. (See AFR 34-52.)

Institute of Technology

IT training is made to order—literally—for the Air Force's future, as well as for its present needs. Emphasis is overwhelmingly on the science and engineering areas, but provision is also made for study in management and arts and social sciences.

Limited to career officers with at least 30 semester hours college credit, IT provides undergraduate and graduate study in its Resident School of Engineering and at selected civilian schools.

Students normally spend one to two years in the IT program, with tuition and travel costs paid by the Air Force. After an interim assignment officers may return for further study. Annual monetary allowances to help defray the costs of books, supplies, and theses preparation are also granted.

Special programs are also conducted at the Resident School of Logistics and at the Civil Engineering Center at Wright-Patterson AFB, in civilian universities, and in the Training-with-Industry program. (See AFR 53-11 and 53-21.)

Education and Commissioning Program

The Airman Education and Commissioning Program, introduced in 1960, enables career-minded airmen to earn both their degrees and commissions.

To qualify, airmen must have 30 semester hours of transferable credit and be able to complete the program prior to their 30th birthday. Those chosen are sent to IT-selected colleges for study in an academic field for which USAF has a specific requirement. Tuition, full pay and allowances are paid by USAF. After receiving his degree the airman attends the 12-week OTS program at Medina Base, Tex.

Of 200 airmen selected during the past year, 159 were below the grade of staff sergeant. (See AFR 53-20.)

Other Opportunities

These are but a few of the educational opportunities available to Air Force personnel. There are many others.

Dr. Wilson H. Elkins, Univ. of Maryland president, presents BS degree to one of 61 Far East Division graduates at 1960 commencement in Tokyo, Japan.

The Air Force Academy's Class of 1965 includes 45 airmen who were selected under the "military quota." Others received Congressional appointments. Special preparatory schools at Ft. Belvoir, Va., and Bainbridge, Md., are designed to aid servicemen in preparing for Academy entrance exams. AFR 53-10 gives the word on the Air Force Academy.

Base Education Offices administer general education development tests at both high school and college level. Successful completion may lead to high school diplomas and up to 24 semester hours college credit.

For the past two years the Air Force has made a strong effort, through its education officers, to advise personnel who are about to retire to consider teaching as a "second career." Many are meeting teaching requirements through off-duty pre-retirement study. (See THE AIRMAN, April 1961, *Teaching Tomorrow).*

Tuition assistance is sometimes available for specialized training, such as at local electronic, accounting and stenotyping schools.

Technical schools and advanced military schools, such as the Industrial College of the Armed Forces and Air University, provide additional training and education opportunities for those at higher levels.

New Methods

The last existing gap in bringing advanced formal education to all personnel exists at the "isolated site," where units are too remote to benefit from college classroom programs.

Among new methods being studied to bring the classroom to these airmen are filmed courses, new teaching machines and programmed texts.

The first of these, a "Continental Classroom" college algebra course presented on 48 films, is being tested at selected isolated sites. One advantage of the filmed course is that it enables students who miss lectures to review the material. Filmed courses on chemistry, physics, and psychology have also been produced.

Test use of teaching machines is also underway. Automated instruction in English grammar and composition, languages, mathematics, and electricity is being offered at a number of bases.

Psychologists claim four great advantages over normal methods of instruction. They say the student learns by small steps; responds immediately to the question; can immediately confirm his answer, and set his own pace.

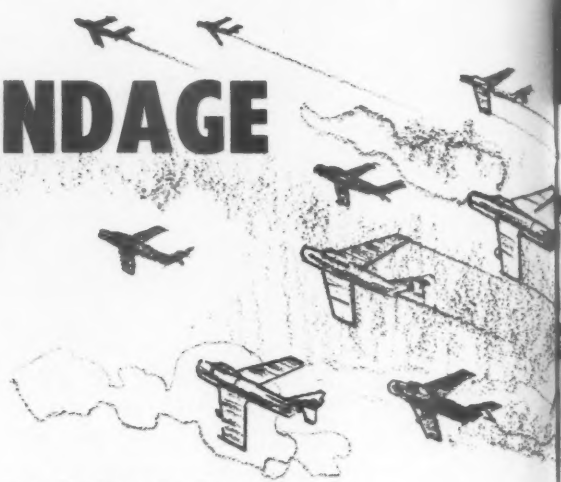
If the system proves successful it will be especially valuable to combat crew personnel on alert duty and airmen at isolated sites.

Educational opportunities for military personnel were never greater, nor the need more important. As one USAF commander recently wrote:

"No one is going very far in today's world—or today's Air Force—without education. This is no secret. We have seen the trend gain momentum like a ball rolling down a steep hill. Today and tomorrow, more and more specialists will be required. This means more and more studying and learning will be the order of the day if one expects to keep pace with the times."

USAF fighter pilots scored amazingly in Korea. One of the leading aces was a WW II vet who relied upon...

KENTUCKY WINDAGE IN MIG ALLEY



by SMSgt. HAL BAMFORD

LATE IN MAY 1952, Air Force intelligence officers noted a brief item in a Communist newspaper, the death of Maj. George Andrews Davis, Jr.

Although unofficial, it helped to confirm their fears that one of USAF's leading Korean aces, missing and presumed dead since February 10, would not return.

The story of his gallant death on a mountainside 30 miles south of the Yalu River, began nearly a decade before. On March 21, 1942, George Davis, a slight youth just past his 21st birthday, entered the Enlisted Reserve Corps for training as an aviation cadet.

A native of Dublin, Tex., young Davis spent his entire pilot-training period within the confines of that state. But once he had graduated and been commissioned, his travels took him halfway around the world and earned him a reputation as one of USAF's leading airmen.

He graduated from flying school in February 1943 and six months later joined the 342nd Fighter Squadron, 348th Fighter Group in New Guinea. Within weeks, Lieutenant Davis was in combat and, early in October, he joined his associate fliers in mourning for a group-mate and fellow-Texan, Col. Neel Kearby, who died after scoring six wins on a single mission. (See, *Cheaper by the Half Dozen,* December '59 issue.)

The example apparently weighed heavily with Lt. George Davis who, before his tour was completed in March 1945, scored seven victories. Davis completed 266 combat missions totaling 705 combat hours, and was awarded the Silver Star, the Distinguished Flying Cross with one Oak Leaf cluster, and the Air Medal with eight clusters.

He returned to the United States in May 1945 and immediately entered the Instrument Pilot Instructor Course at Bryan, Tex. A variety of assignments followed during which he was promoted to captain, completed transitional jet training, and graduated from the Air Tactical School.

When the shooting erupted in Korea, Captain Davis was assigned to the U. S. based 71st Fighter Squadron, 1st Fighter Group. However, as the fighting surged back and forth across the mainland peninsula, it became obvious that experienced fightermen would soon be journeying to the Orient in increasing numbers.

Major Davis received his call in October 1951. When he arrived, he was assigned to Headquarters, 4th Fighter-Interceptor Group. But on November 10, with his experience serving as a major factor, Maj. George A. Davis assumed command of the 334th Fighter-Interceptor Squadron.

During the next three months, Major Davis vaulted into headlines across the world on the strength of his leadership and amazing feats of aerial skill.

The veteran Texan was soon adding to his impressive list of decorations. On November 20, 1951, he was awarded a second cluster for his DFC in recognition of heroic behavior near Sinanju, Korea.

During this engagement, he destroyed two enemy Mig-15 fighters, and the unit he led was credited with the destruction of two others. In addition, they claimed a probable and listed another as "severely damaged." The fight had been won against overwhelming odds.

In January 1952, he received an Oak Leaf cluster for his Silver Star for action on November 30th. In February, he added a ninth Oak Leaf cluster to his Air Medal. After his death, a third Oak Leaf cluster was awarded for his DFC and a second for his Silver Star in recognition of earlier feats. The Silver Star award was for action on December 13, 1951. In both instances, kills keyed the award.

All told, Major Davis completed 60 combat missions during the 90 days he served as commander of the 334th Fighter-Interceptor Squadron. He compiled a total of 79 combat hours and scored 14 victories. These

In the Name of Congress

No. 36 IN A SERIES

included 11 Mig-15s and 3 TU-2s. Additionally, he was "credited" with a probable, also a Mig-15.

Throughout his brilliant career, Major Davis never lost his sense of humor. When his repeated victories resulted in worldwide headlines, reporters dogged his footsteps to record his latest accomplishment. It was during one of these interviews that Major Davis, in commenting on the methods he used, referred to a rapidly fading art.

A war correspondent, interested in the reasons for the prevailing 14-1 ratio between U.N. and Communist aerial victories, questioned Davis regarding the effectiveness of a new gun sight. He wondered if the wonderfully effective fighter pilot would credit the sight with a major portion of this success.

Major Davis mulled the question over momentarily, then dryly answered that, with no disrespect meant to the equipment, his faith lay in mental calculations and an old Texas trick, commonly known as "Kentucky windage." The story was soon being headlined in the U. S. and only served to add to the ace's fame.

Brilliant though it was, his combat success was soon to end. On February 10, 1952, Major Davis was a member of an aerial patrol mission which ran into trouble soon after it reached Mig Alley. The citation, published on April 30, 1954, relates the story of that mission which resulted in this nation's highest award.

Maj. George A. Davis, Jr., distinguished himself by conspicuous gallantry and intrepidity at the risk of his life above and beyond the call of duty near the Sinuiju-Yalu River area, Korea, on 10 February 1952. While leading a fight of four F-86 Sabrejets *on a combat aerial patrol mission near the Manchurian border, Major Davis' element leader ran out of oxygen and was forced to retire from the flight with his wingman accompanying him. Major Davis and the remaining F-86 continued the mission and sighted a formation of approximately 12 enemy Mig-15 aircraft speeding southward toward an area where friendly fighter-bombers were conducting low-level operations against the Communist lines of communications. With selfless disregard for the numerical superiority of the enemy, Major Davis positioned his two aircraft, then dove at the Mig formation. While speeding through the formation from the rear, he singled out a Mig-15 and destroyed it with a concentrated burst of fire. Although he was now under continuous fire from the enemy fighters to his rear, Major Davis sustained his attack. He fired at another Mig-15 which, bursting into smoke and flames, went into a vertical dive. Rather than maintain his superior speed and evade the enemy fire being concentrated on him, he elected to reduce his speed and sought out still a third Mig-15. During this latest attack his aircraft sustained a direct hit, went out of control, then crashed into a mountain 30 miles south of the Yalu River. Major Davis' bold attack completely disrupted the enemy formation, permitting the friendly fighter-bombers to successfully complete their interdiction mission. Major Davis, by his indomitable fighting spirit, heroic aggressiveness and superb courage in engaging the enemy against formidable odds exemplified valor at its highest.*

The decoration was the 46th bestowed upon a member of the United States Air Force or of the units which preceded its autonomy. More important, it marked the first proferred for action in jet aircraft, thus signifying a new era in aerial combat.

In addition to the decorations previously listed, George A. Davis, Jr., was also posthumously promoted to the grade of lieutenant colonel on April 13, 1953.

A grateful Korean government joined the honors parade by voting the award of the Korean Ulchi Medal in recognition of the contribution this Texas fighter-pilot had made to the freedom of their nation.

Communism and You

by Ch., Lt. Col., JOHN A. CARLIN
USAF Chaplain Board

SOMETIMES FATHERS AND MOTHERS who are only in their thirties or early forties are startled when their children ask, "How were things in the olden days when you were young?" It's the word "olden" in that question that gets them down. It makes them feel as if their childhood was spent during the days of King Arthur and his court. It isn't surprising that youngsters should use terms like "olden days" since 43 percent of the people in the United States today are so young that they have no personal recollection of the 1930s, the period of the great depression.

We older people are therefore not particularly surprised that a great many Americans do not know a whole lot about Communism. The events that marked its surge to power began, for the most part, in 1917, a few years before many of the current crop of parents were born.

Before we touch on the history that was made in 1917, we have to go back still another 69 years, to 1848. It was in that year that Karl Marx published his small book entitled, *The Communist Manifesto*. It is probable that even he could not have foreseen the effect that this book was to have upon the world in the hundred years that followed.

Marx was born in Germany in 1818 but he spent half his life in England where he was deeply moved at the plight of the working people. It is true that at that time they were paid pitifully low wages and worked long hours in the mines and in the factories. His solution to the problem, however, was fantastic. He yearned for the day when the workers would revolt against the owners and take things into their own hands. Someday, he thought, no one person would own anything; everything would belong to the "state" and everyone would be equal.

There was nothing startlingly original about this theory of Karl Marx. Other philosophers and sociologists had proposed "communal life" as a solution to the troubles of mankind. Marx added this: If people would not live the common life willingly, a good bloody revolution or two might bring them to their senses! He could not imagine people living without strife—not until they were all converted to his form of Communism, that is! Marx viewed the history of the human race as a long series of "class struggles."

In primitive times, men fought for the ownership of tools. Later in history, slaves fought against masters. Later still, serfs strove against the feudal lords. In the Marxist theory, the struggle would some day involve the workers against the capitalists. He predicted a time in which the workers would take over and establish the "Dictatorship of the Proletariat." He wrote, "Let the ruling classes tremble at Communist revolution. The proletarians have nothing to lose but their chains."

The final stage in the pattern predicted by Marx would be a "Communist Society" in which there would be no class struggles at all. Even the state would disappear since it would no longer be needed. Peace and harmony would prevail among all the peoples of the world.

In the above paragraphs we have touched upon the social theories of Karl Marx. His philosophy went far beyond normal bounds in other ways. Communism condemns, for example, all belief in God, and active measures have been taken to stamp out religion among the nations under Red domination. If there be no God, then God cannot be the source of rights. From whom or from what, then, does man get his rights? The Communist answer: From the state. Which leads to the logical conclusion that if the state gives rights, the state can take them away. Hence, to clamor for rights or for freedom is to revolt against the Communist state.

Where does "man" fit into the Marxist picture? Marx called man a "producing animal." He exists for the state. He has no soul nor any hope of life beyond the grave. His morality will be guided by this code: An action is "right" if it benefits the Communist state—it is "wrong" if it does not benefit the state.

Compare the philosophy of the above paragraphs with the American concept of democracy. Our system is founded primarily upon belief in God. All men are "endowed by their Creator with certain unalienable rights," reads the Declaration of Independence. The state exists to serve the citizen, not the reverse. Our basic morality is found in the Ten Commandments which are the Laws of God. Communism and American Democracy are as opposed as any two systems can be. As long as we practice the principles of Democracy as established by the founders of our nation, Marxism will find no permanent roots among us.

Marx was not a revolutionist himself in the violent sense of the word; he concentrated mostly upon writing and lecturing—hoping that someone would come along to put his theories into practice. He died in 1883 without seeing the revolution he so dearly desired come to pass. But 34 years after his death, the world became acutely aware of a man named Lenin who launched the famous "October Revolution" in Russia. The year was 1917.

In America, Lenin's followers, called the "Bolsheviks," were shown in political cartoons as great, shaggy-bearded fellows who always seemed to be in the act of throwing bombs. Americans thought the word "Bolsheviks" itself was rather amusing. It was hard for them to realize at that time that this was the beginning of a tremendous movement in history that would result in 40 short years in dividing the world into two camps, "The Free World" and "The Communist World." But we are running ahead of our history.

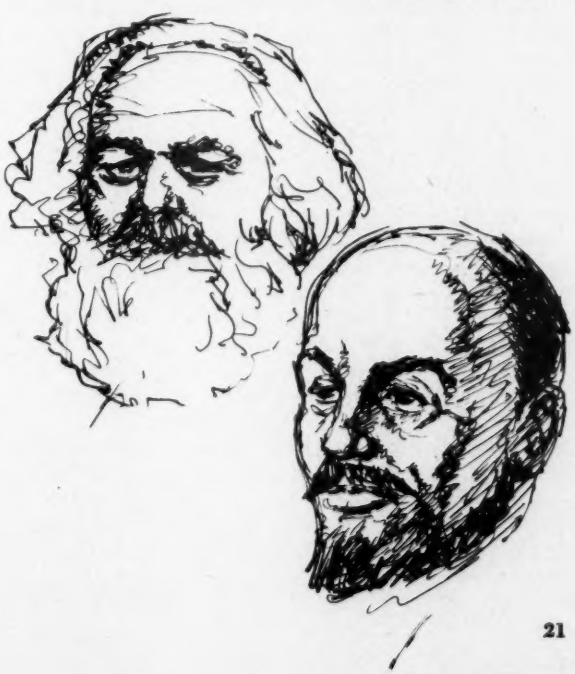
Lenin for many years studied the communist theories of Marx most thoroughly. He knew that the time and the place for the revolution would one day present itself.

Lenin was not himself a "worker" in the accepted meaning of the word. His father was known for his work in education. It was after his brother, Alexander, was hanged for his part in a plot against the life of Czar Alexander III that the young Lenin turned from his inherited faith and sought out the revolutionists. He knew the bitterness of exile from his native land and he spent the years studying and planning for his return. Strangely enough, he was sent back to Russia by the German General Staff during World War I. They saw a revolution in Russia as an ideal means of separating the Russians from the allies of the west.

The revolution fomented by Lenin and his followers successfully unseated the Kerensky government in Russia and the way was open for the inauguration of the first "Communist" state. The theories advanced by Karl Marx in his *Communist Manifesto* and in his lengthy book, *Capital,* could now be put into practice.

Lenin established a "police state." A police state is one in which all freedom disappears and all opposition to the government is suppressed by intimidation or by violence. That was Russia under Lenin and his associates. "Liquidation," a polite term for murder, was the fate of anyone who disagreed with the Communist Party and its leaders. It is estimated that some 28,000,000 people died violently or were exiled between 1917 and 1922. It was in 1922 that the "Union of Soviet Socialist Republics" was established encompassing Russia and a few surrounding areas. Could anyone have foreseen that by 1961, Communism would dominate the lives of over 900,000,000 people and engulf nations covering one-third of the land surface of the earth?

Lenin died in 1924 fearing to the last that the government would be taken over by one of his followers, a man named Josef Stalin. Lenin pleaded with the Politburo as he lay dying not to allow this to happen. Stalin was too ruthless, he told them—too inhuman. There was little, however, that the Politburo could do to prevent Stalin from taking over. Stalin had laid his plans well and had strategically placed his henchmen in positions of importance. By 1927, he was in full control of the U.S.S.R. He had driven off all opposition. The world literally sighed with relief on March 5, 1953, when announcement was made that Stalin was dead.



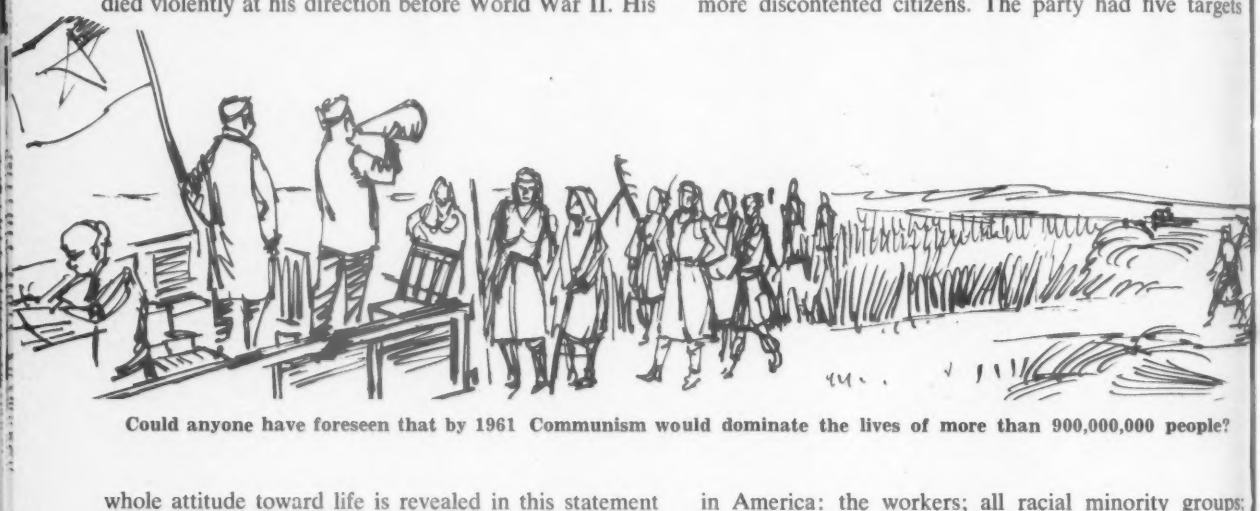
As a young man, Josef Stalin studied briefly for the priesthood of the Orthodox Church. He was expelled from the seminary for organizing secret societies! This seems to have been one of his major talents because shortly after his expulsion he was in great demand as a labor agitator. He joined forces with the Marxist revolutionaries under Lenin and was his *aide de camp* when the Bolshevik leader came into power. Lenin used Stalin in many capacities, particularly in those requiring ruthlessness, in his rise to the dictatorship of the Communist Party. It is understandable, therefore, that he feared what might happen if Stalin were to succeed him as head of the party and of the Russian state.

Stalin's methods of dealing with "deviationists" were even more brutal than those of Lenin. The word "purge" assumed a new meaning during his dictatorship and it is estimated that more than 3,000,000 people died violently at his direction before World War II. His whole attitude toward life is revealed in this statement which he made when he was rising to power: "To choose one's victim, to prepare one's plans minutely, to stake an implacable vengeance, and then go to bed . . . there is nothing sweeter in the world."

The Russian people were never known to have had great love for Germany, nor had Stalin, their leader. It was therefore with great surprise that the world learned in August 1939 of a non-aggression pact signed by Stalin and Adolf Hitler. Assured by this agreement that Russia would not attack Germany, Hitler's armies marched into Poland in September 1939 and launched World War II, while Soviet armies marched in and shared the booty by occupying the eastern half of the country. The pact was not to last long, however, for it was broken in 1941 when Hitler ordered an attack upon Russia on his eastern front. Overnight, in a literal sense, the Communist moved from a position on the side of Hitler to a partnership with the Western Allies.

The end of World War II saw tremendous advances by Communism as country after country in Eastern Europe was "liberated" by the Reds. Stalin lived to see even China with its teeming millions come into the Communist orbit and under the Red banner in 1949. The Russian Empire of 1917 covered eight million square miles and included 145,000,000 people. By 1957, the Communists, by conquest and by "satellite colonialism," had come to dominate 16 million square miles and over 900,000,000 people. Today, two worlds stand in conflict: "The Free World" which looks to America for leadership, and "The Communist World" directed by Moscow. The conflict now is "cold," the struggle being concentrated upon seizing the minds of men. It is a battle of ideas—the "freedom idea" versus the "communist idea." Eventually, there will be only one victor.

America has been on the Communist "list" for a good many years. The Communist Party, USA, was first established in 1919. During the restless 1930s when the United States was in a great economic depression, the party made headway among some of the more discontented citizens. The party had five targets in America: the workers; all racial minority groups; the armed forces; youth groups; and the intellectuals. For over 40 years relentless programs of infiltration and propaganda were aimed in their direction. By 1939 the party in the United States numbered an estimated 59,000 known members.



Could anyone have foreseen that by 1961 Communism would dominate the lives of more than 900,000,000 people?

The Communist Party, USA, has had to display amazing agility in changing policy through the years. For example, when Stalin made his non-aggression pact with Hitler in 1939, even the CPUSA was caught off balance. But not for long! Immediately, it assumed a pro-Nazi character. Hitler became a blood brother. Europe was advised that "The Yanks are *not* coming." America must not help the allies. Two years later, when the pact was broken by Hitler's attack upon Russia, the whole outlook changed. America must go to war at once to help Russia and the other "democracies" in their fight for peace. This was confusing but not unexpected since Communists have the ability to take advantage of everything that moves in their favor.

In the years following 1945, the CPUSA fell into disfavor in America when its true nature was revealed. Certain of its leaders were tried and jailed. The party

symbol disappeared from the election ballots. Any doubts that remained concerning the aims of Communism disappeared during the Korean conflict. Many wrote the party off as dead in our country. But it is still very much in business!

The 17th National Convention of the Communist Party was held in New York City for four days in December 1959. There was nothing "secret" about this convention. A man named Gus Hall was elevated to leadership. He is an ex-convict who declared in 1934 that he preferred America with a Soviet form of government. We have no reason to believe that he has changed his mind since that time. The party hopes for a 10 percent gain in membership this year and all party branches will set themselves a quota to try to achieve that end. *The Daily Worker,* which went out of business a few years ago, will be revived. As for infiltration, Hall advised his followers to "participate in, organize and lead the broadest of united front movements—on every level—in a thousand ways, in 10,000 places on 100,000 issues—if possible with all 180,000,000 people in America."

The title, *Communism and You,* that heads this article was chosen with a purpose. The men who fought and bled on the Korean battlefronts saw Communism —close up. The thousands of prisoners of Korean PW camps personally experienced the tactics called "brainwashing." They could tell you much about the system. They knew that they were involved in "all-out" conflict. Anyone in our country with an ounce of Americanism in his soul knows that the "freedom idea" is worth fighting for—and worth dying for, if need be. Countless thousands of our fellow countrymen have laid down their lives for this principle in the conflicts of the past.

The Moral Leadership Program of the United States Air Force moved into the training areas with the publication of AFR 50-31, dated 14 February 1961. The topic chosen for presentation during the July-September 1961 quarter is *Communism and You.* It is no accident that this article bears the same title and that it appears in THE AIRMAN at this time.

A 20-minute film in color has been made concerning Communism with Lt. Gen. Joseph F. Carroll, the Inspector General of the United States Air Force as narrator. A member of the FBI before he joined the Air Force, General Carroll possesses a knowledge of Communism that few men in the United States share. The film will be presented Air Force wide and will focus the attention of all personnel on this timely subject.

Chaplains and Training Officers will appear on platforms in base theaters, service clubs, hangars, and wherever Air Force personnel gather for the Moral Leadership presentations. They will be for one objective: to awaken an awareness of the moral responsibility we all share to defend our country against all aggressors. Aggression is not always launched in the form of bombs; often our citizenry will be attacked with the weapons of propaganda. American institutions will be belittled, religion scoffed at, and decency derided by our Communist opponents. Under the guise of "liberalism," an effort will be made to undermine our moral defenses. The attacks will often be so subtle that unless we keep our wits unusually keen, we may not know that we are being attacked.

The "Free World" standing outside our borders, looks to us for leadership. They have seen Communism creeping relentlessly across the face of the earth. The Communists do not conceal their objective. Khrushchev, the present party leader, has told us, "We will bury you!" But men with the "freedom idea" do not bury easily. If we live our Americanism every moment of every day—if we recognize and worship the God who gave us our rights and freedoms—if we grow in the virtues of justice, honesty and fair-dealing—we will have nothing to fear from Communism for we shall be forging weapons that no subversive system ever devised by man can overcome.

THE NEWK

by SMSgt. HAL BAMFORD

E. C. Newman seems the best bet for national honors.

Soph quarterback Joe Rodwell starred in the spring game.

Bob "The Rodent" McDonough, spot-runner extraordinaire.

SEPTEMBER 23 is D-Day in Denver, Colorado.

On that date, Ben Martin unveils the '61 edition of his United States Air Force Academy Falcons.

Disaster could result. By the same criteria, success could breed further success.

The ingredients are amazingly similar to those which comprised the surprise-package team of 1958. That group stunned the football world with an early upset, went on to a 9-0-2 record, and finished their run in the Cotton Bowl on New Year's Day.

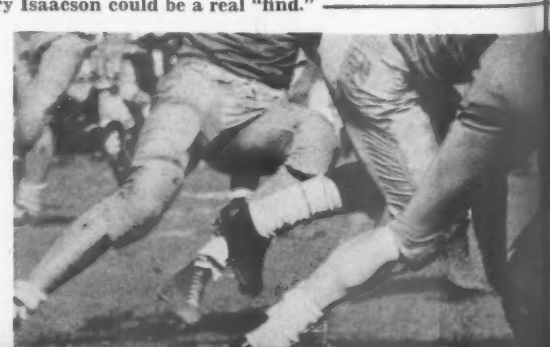
This fall, Martin will again field many youngsters who, though untried, hold tremendous promise for the future of football in the Rampart foothills. The nucleus of that 1958 starting squad was also sophomores — promising, but untested. They proved their worth by going on to become the "names" that are now missing: the Mayos, Quinlans, Brickeys, and Lanes. For the Cotton Bowl Kardiac Kids, there were no "names" to replace. Football was then still in its infancy at the Academy.

This year, the crucial test is the opener — nationally recognized UCLA on September 23. In 1958, the big test came second on schedule — Iowa, one of the nation's true powers.

Early Key

Those Hawkeyes provided the key that Martin

Sophomore halfback Terry Isaacson could be a real "find."



KARDIAC KIDS

hopes to duplicate at UCLA's expense this year. Definite underdogs, the Falcons sailed into Iowa City, stunned the vaunted Big Ten favorites with a 13-13 tie, and fused themselves into a solid unbeatable unit. A win or a tie against UCLA later this month could have much the same reaction. The new young squad could "jell," and become the same sensation their older brothers were.

Spring practice in '58 gave Martin his clue. There, the youngsters bounced into unexpected prominence. Last April the '61 spring game contained many similar unexpected surprises.

When the dust had settled, the Silver owned a 22-12 win over the Blue. Intrasquad scores, in themselves, are seldom surprising. But the fact the Silver team was comprised largely of youngsters up from the frosh squad gave the staff a case of arched eyebrows.

Sophs Star

Naturally Martin admits it's too soon to crow. You don't lose the likes of Rich Mayo and Mike Quinlan and replace them with equal experience immediately.

However, he also realizes that he has a pair of new "finds" on his hands that may well develop into an equally brilliant combination. The newcomers are Joe Rodwell and Terry Isaacson.

Both are sophomores, and they shared quarterbacking duties on last year's freshman squad. Rodwell piloted the Silvers in the spring game and was little short of sensational. Isaacson moved over to a halfback slot and blossomed with equal brilliance.

Between them, they figured in all the Silver's 22 points. Each scored one touchdown, and Rodwell passed for a third. Joe also rushed for one two-point conversion and passed for another.

They accounted for 129 of the winning squad's 218 yards gained by rushing. In near-gale winds, Rodwell called a near-perfect game. Though he completed only two of seven passes, one went for a touchdown, and Martin considered the wind a major factor in several of his incompletions.

In the same game, Issacson provided some of the most brilliant punting ever seen at the Academy. He kicked for a 36-yard average, and one traveled 86 yards from scrimmage. Again, the wind was a factor and held his average below his potential.

While Rodwell and Isaacson are currently drawing the most attention, there are at least a half-dozen other graduates from last year's fledgling squad who also figure prominently in Martin's planning.

Principal among these are Ray Lennon and Jim Sears, ends; Gil Achter, a tackle; Ray Thomas and Chris Koster, guards; Mike Galbreath, a center; and Dave Sicks, fullback.

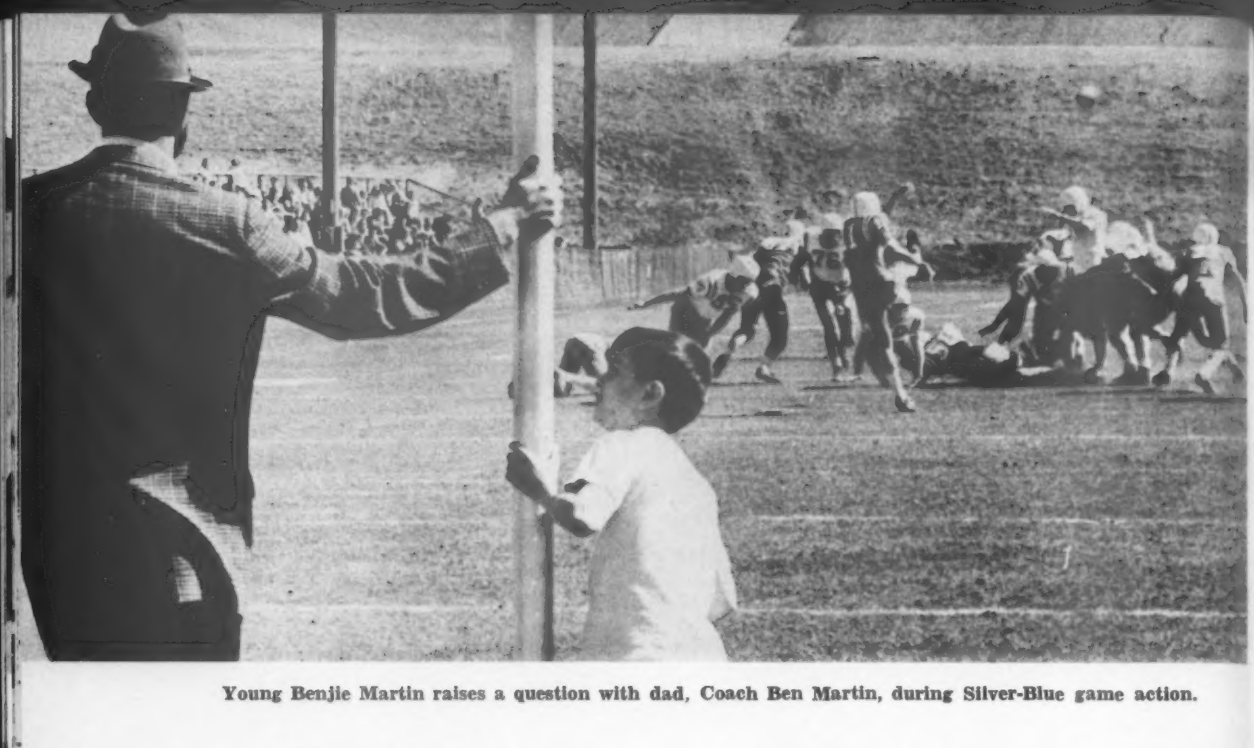
Newman A Good Bet

All of this talk about sophomores is not to be taken as an indication that no veterans are returning. As a matter of fact, it seems probable, at least in the early going, that Martin will rely heavily on his veterans. And, except for the backfield, he can field lettermen in every position.

Probably the Falcon's best bet for national honors lies in center E. C. Newman, a six-foot-three, 215-pound senior. Newman has had knee trouble in the past, but he underwent an operation earlier this year and hopes that problem is now solved. Defensively, there are few men of his calibre in college football.

All told, 14 lettermen return. Seventeen were lost through graduation. In addition to Newman, such familiar names as Carlton Simpson, Bruce Kohl, Ken Needham, Pete Bobko, Don Baucom, and Bob McDonough will be back.

Baucom should be invaluable. Even among the illustrious "names" of '60, he was the busiest man in the backfield. Baucom led the squad in playing time last year and compiled a 4.1-yard rushing average.



Young Benjie Martin raises a question with dad, Coach Ben Martin, during Silver-Blue game action.

"Rodent" Returns

Another player who can be counted on to make his presence felt is Bob "The Rodent" McDonough. Weighing in at less than 140 pounds, McDonough is one of the most brilliant spot performers yet to wear the Silver and Blue. Although he carried the ball only 17 times from scrimmage last season, his 7.1 average was the squad's best. Additionally, he returned 13 kickoffs for 280 yards and seven punts for 99 yards and scored two touchdowns.

Among the other possibilities for stardom, Nick Arshinkoff could be a real standout. Nick was placed on academic leave last winter after being thrown for a loss by the books. However, he returned to the Academy last month to resume his education. In the Falcon's final three games last year, Nick grabbed the headlines from his more touted teammates, and finished the season third in total rushing yardage despite the fact he carried the ball less than 50 times.

As usual, Martin will stick with his flexible winged-T as the basic offensive formation. As with any other T, this calls for key performances from the quarterback. While Rodwell is acknowledged to be the outstanding sophomore, the spot is not going to him uncontested.

When the whistle blows later this month, the chances are good that the more experienced Jerry Thies may be holding forth as field director. Although he didn't letter last year, Thies did gain some varsity experience, and he guided the Blues brilliantly in the spring game. As a matter of fact, despite the wind which hampered Rodwell, Jerry hit on 10 of 16 passes, two of which went for touchdowns and the only Blue points.

Tough Task

Despite some guarded optimism, Martin's job does not appear to be an easy one. As Ben himself says, "It appears our line will be fairly strong, but will depend on untested players for reserve strength and depth." This lack of depth will mean more reliance on sustained performance from the starters. If injuries can be avoided, the ball club could be tough, especially defensively.

Offensively, the problem lies with the youngsters. If they come through at peak ability, the club could also provide a major scoring threat. Whether their lack of experience will hamper their consistency is a question only time can answer.

As noted earlier, September 23 is D-Day. A performance equal to that in Iowa City three years ago could make the Falcons a most interesting ball club.

1961 FALCON SCHEDULE

Sept. 23	**UCLA at Denver (N) (0-22)**
Sept. 30	**Kansas State at Denver (N)**
Oct. 7	**SMU at Dallas**
Oct. 14	**Cincinnati at Cincinnati**
Oct. 21	**Maryland at Denver**
Oct. 28	**New Mexico at Albuquerque**
Nov. 4	**Colorado State at Denver (32-8)**
Nov. 11	**California at Berkeley**
Nov. 18	**Baylor at Waco**
Dec. 2	**Colorado at Boulder (16-6)**

(N) Night game. 1960 scores in parenthesis. 1960 record 4-6-0.

SLANTS ON SPACE

Oceanus Procellarum (Ocean of Storms), a designated target region for the first U. S. instrumented lunar research devices, is the largest of all the waterless "seas" on the visible side of the Moon. Its area is computed at about two million square miles, or approximately two-thirds the area of the continental United States.

Most of the Ocean of Storms is located in the northeast quadrant of the Moon but a portion extends into the southeast quadrant. The region covered by this sprawling lunar feature has been regarded as a likely target zone by experts for some time. This is not because the quadrant is believed to hold greater promise of scientific data returns than any other quadrant, but rather in view of dynamic considerations connected with plotting trajectories for research packages. Almost three years ago an article in THE AIRMAN singled out the northeast quadrant as an advantageous initial landing zone for automated, then manned exploration. (See *Mission: The Moon,* September 1958 issue.)

Immediately adjoining the Ocean of Storms on the north is *Mare Imbrium* (the Sea of Showers) which has been called the grandest and most nearly perfect of all the lunar seas. Roughly circular in shape, it has a diameter of some 700 miles and presents a lava-like plain big enough to hold the states of Colorado, Arizona, and New Mexico. Only a few craters pockmark its apparently even floor. An arc of four lunar mountain ranges delineate much of its confines, making the *mare* a readily distinguishable topographical feature.

For all intents and purposes of initial lunar research, *Mare Imbrium* may be considered an extension of the *Oceanus Procellarum* as a target zone. Some studies to date favor this particular *mare* as a landing area for ultimate manned missions because, among other reasons, daytime temperatures there would be more moderate and pose less formidable problems for instruments and personnel than locales in the vicinity of the Moon's equator.

The Sea of Showers is favored by some astronauts for an initial landing area.

Flanking *Mare Imbrium* on the east but separated by the Jura Mountain range is *Sinus Roris* (Bay of Mists) which may be regarded as a smaller arm of *Oceanus Procellarum.* It, too, has figured in advance evaluations of landing zones for manned vehicles. Temperature factors there would be roughly comparable to those in the *Mare Imbrium* region. Incidentally, one of the earliest to nominate Misty Bay for soft-landings' study was Dr. Werhner Von Braun.

In the central section of *Oceanus Procellarum* are two of the most conspicuous of the Moon's many craters, Kepler and Copernicus, named for the two geniuses who figured so importantly in the beginnings of modern astronomy. Observers have no difficulty in identifying these because each is the center of a ray system—long tapering streaks of light color which radiate many miles in all directions from the crater which is apparently their focus of origin. For astronomers, these ray systems are far from the least of the numerous puzzles posed by the Moon. While the number of visible lunar craters totals some 30,000, only a few dozen of these have optically detectable ray systems associated with them.

Kepler and Copernicus are located close to an east-west line, with Kepler the more eastern of the pair. While lunar measurements are currently the subject of several new review studies which promise to result in numerous revisions, Kepler is estimated to have a diameter somewhat over 20 miles and a depth in the order of 10,000 feet. From the crater's floor arises a central mountain peak, a distinguishing feature of some of these lunar depressions.

Copernicus measures some 55 miles across from wall to wall, and these rise perhaps 12,000 feet above the crater floor. The ray system streaming out from Copernicus is considered the second most important on the Moon's visible face.

A major scientific controversy of long standing centers on whether the visible topography of the Moon is the result of heavy meteoritic bombardment aeons ago or vulcanism (some form of volcanic action, although not necessarily the same kind responsible for great changes in earthly terrain). Implicit in the clash of theories is the question whether the Moon is or was a dead celestial world.

The placement of seismic instruments in the area between the equator and the Kepler-Copernicus latitudes as expected should begin to provide data as to which of the differing hypotheses is tenable. Other equipment could telemeter any indication of the presence of components of some types of meteorites.—WILLIAM A. KINNEY.

The craters Copernicus (left) and Kepler are each centers of a ray system.

SAC'S SUPER STRATO-FORTRESS

MORE SPEED, MORE RANGE, MORE FLEXIBILITY MARK THE B-52H

by SMSgt. Paul D. Kackley, Hq SAC

IT'S WHAT'S UP FRONT THAT COUNTS in the engines that power the Air Force's newest bomber.

Up front in each of the eight engines on the B-52H —the latest model in the long line of the Boeing-built planes—is a huge fan that gives the engines some 30 percent more thrust and greatly increases the range of the bomber over previous models.

To the untrained eye, there is little difference between the H model and other B-52s. The plane is the same, but there are changes in the engine nacelles. Air inlets are larger and the fan nozzles break the contours on the flanks of the nacelle. The shape of the nacelles was set after extensive wind-tunnel tests.

But ask the man who flies the H model just what the turbofan engines mean to him.

"Tremendous thrust," states Capt. Frank A. Burrell, pilot of the first H model turned over to the Air Force by the factory. The plane, which bears serial number 60001, is assigned to SAC's 379th Bomb Wing at Wurtsmith AFB, Mich.

Burrell, a former B-47 pilot who recently completed a B-52 pilot training course that included several hours of study of the differences between the H and earlier models, continued:

"The improvements in this airplane must be experienced by the individual. You just can't put into words all of the changes that make this better than other models."

According to engineers, use of the turbofans is similar to adding propellers to the jets. The turbofan exploits the efficiency of the propeller without the complexity of conventional propeller design and without affecting the high-speed characteristics of the jet. Nearly half of the turbofan's tremendous thrust is produced by the fans.

For the technically minded, the fans have been substituted for a section of the compressor in the forward part of the engine. In the aft section, an extra turbine stage has been added to drive the fan. The engines, designated TF-33, are built by Pratt & Whitney.

Each of the turbofan engines on the B-52H can develop up to 17,000 pounds of thrust as compared to the 11,000 pounds put out by the power plants on the G model of the B-52.

The exact range of the H is classified, but Boeing officials say that the turbofan-equipped plane has "a good margin of increase" over the 10,000-mile range of the older bomber.

Col. John H. Kunkel Jr., commander of the 379th Wing, summed up the performance of the B-52H after flying plane number 60001 from the factory at Wichita, Kans., to Wurtsmith.

"It's the best of the bomber fleet," he said. "It is greatly improved in performance, crew comfort for 24-hour missions and has the ability to do the job for which we need it."

SAC's military planners are equally pleased with the B-52H and its ability to do its job. Its longer range reduces refueling problems, freeing some of the tanker fleet for other duties, and since fewer refuelings are needed, simplifies mission planning for long-range flights.

Its tremendous power and extended range will make the B-52H an even more deadly missile platform than

its predecessors. It can carry four *Skybolt* missiles in addition to its regular bomb load. However, until the *Skybolt* is put into production, the H models will be equipped with *Hound Dog* missiles.

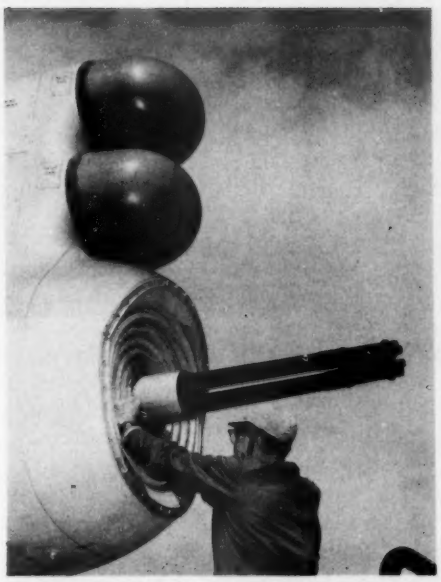
In time of war, the B-52H could smash targets more than 1,000 miles away with its nuclear-armed missiles, then attack other targets with its normal bomb load. Thus on a single flight, one plane would be able to destroy several different and widely separated target complexes—a definite tactical advantage.

And, by using the hypersonic *Skybolt* missiles to knock out enemy defense forces, the H model would soften heavily defended areas. The result—fewer aircraft lost and more planes available for restrike missions.

For its own defense against enemy interceptor planes, the B-52H is equipped with what is described as the most advanced defensive armament system of its type. This is the six-barrel Gatling gun mounted in the tail of the plane which is capable of firing 4,000 20-millimeter shells a minute.

SAC's newest bomber is also equipped with more refined and modern electronic defensive and offensive subsystems than earlier models.

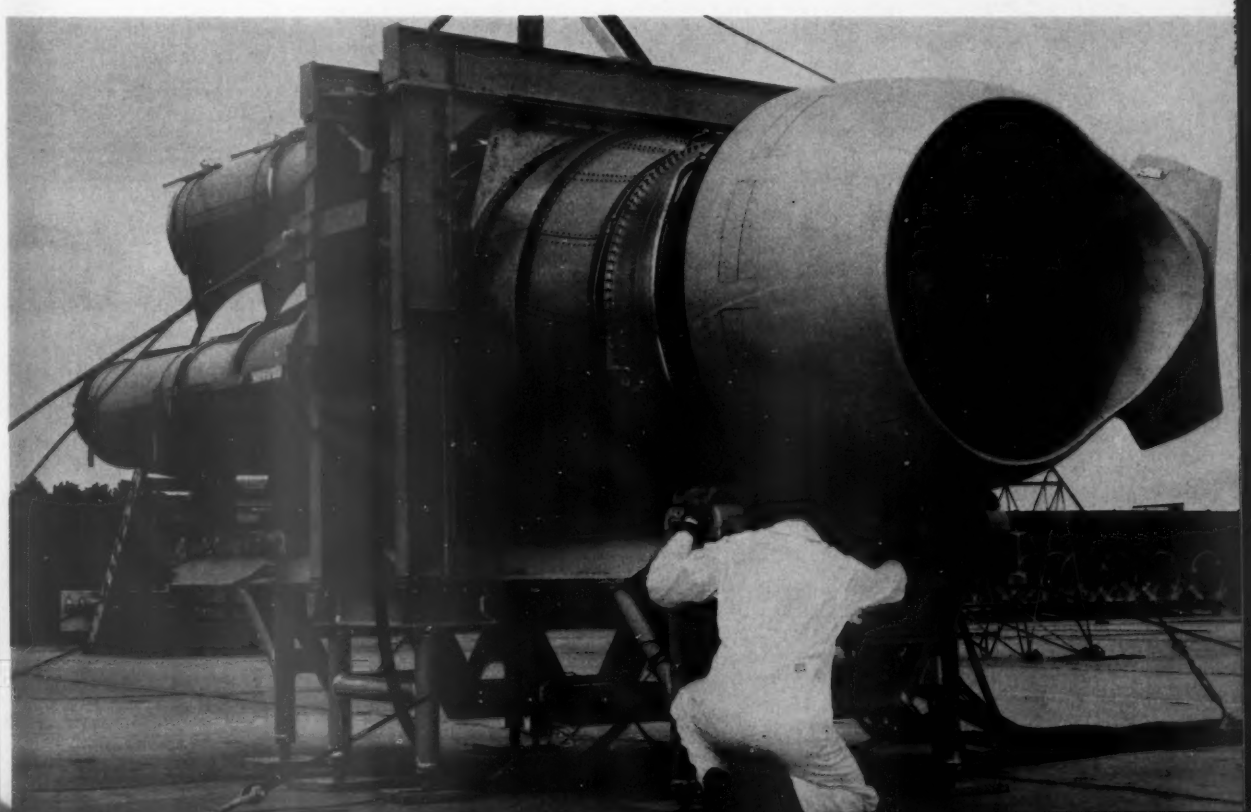
In all, the B-52H has made a great impression on those who have flown it and those who would direct the SAC force in time of war. These are the men who have labeled the Air Force's newest missile bomber "the Free World's most flexible deterrent to aggression."



Deadly stinger in tail is Gatling Gun. The weapon, fired by remote control, delivers a 20mm barrage of high-speed destruction.

This view illustrates the size of the turbofan engine, eight of which will power the B-52H. Test stand will enable SAC to build stockpile of fully tested engines.

—Boeing Aircraft Photos



ELECTRICITY IN A PACKAGE

THIS FALL, as the first chill winds of winter begin to sweep the western plains, an isolated SAGE radar station will begin to draw electric power from a unique source. The station is located in northeast Wyoming, near a town bearing the colorful and provocative name of Sundance. The site, a new component unit of the air-defense network guarding the North American continent, stands high on the slopes of Warren Peak, a 6,650-foot giant dominating the surrounding plains. The source of power is PM-1, the first nuclear power plant to serve an operational Air Force installation.

A dependable supply of power for operational equipment as well as light, heat, cooking, etc., has always posed a problem at remote locations, in many cases miles away from the poles and wires of commercial sources. Diesel power units offer one solution; but logistics can be awkward. Frequently the cost of transportation runs far in excess of the price of oil. PM-1 points the way to a clean, permanent, dependable, economical answer.

The designation PM-1, pinned on the plant by the Atomic Energy Commission, stands for "portable, medium power range, plant number 1." AEC and the Department of Defense in partnership developed the concept under the Army Nuclear Power Program (ANPP), so called because the Army acts as agent for all three military services. The Martin Company of Baltimore is the civilian contractor for the project.

Heating water to make steam, which in turn drives a turbine generator, is the way most electricity is made. In the PM-1, this is also true. However, the heat is derived from a fuel core, encased in a special container. The PM-1 core contains 741 hollow tubes with about an ounce and a half of uranium-235 in each one. The tubes are sealed so that water passing through the core under pressure is heated. In a "secondary loop," to prevent nuclear contamination, other water is heated and steam is formed at 300 psia. This drives the steam generator. As the steam is routed through the system, heat is extracted and the cooled water is recycled. The fuel core is about the size of a 55-gallon oil drum, the plant is designed to provide power for two years without refueling. The PM-1 will generate enough high-quality electricity (one megawatt) to serve the needs of an average civilian community of 2,000 people. It is also designed to provide 7 million Btu/hrs. of space heat to assure a shirt-sleeve environment in the coldest climate. Martin-Vice President, J. Donald Rauth says, "This plant will use about 20 pounds of nuclear fuel in two years and release energy equivalent to that produced by four and a half million gallons of high-grade fuel oil."

The P for "portable" is an important distinguishing feature of the engineering in PM-1. Component "packages" making up the prefabricated plant are specifically designed to be transported by C-130 aircraft of the Tactical Air Command.

The packages, transported on skids, contain individual units. One contains the control console. Another has the turbine generator unit. Still another contains maintenance equipment. The reactor tank, steam generator tank, and spent fuel storage tank are each designed to be airlifted as a skid.

Once the packages are inter-connected and the core is inserted, the nuclear power plant is immediately operational.

The packages are so developed that foundations are rarely required except in permafrost conditions.

Aircraft of the 62d Troop Squadron of Sewart AFB, Tenn., airlifted the first nine packages from the factory to Ellsworth AFB near Rapid City, So. Dakota, at the end of May. From the staging area at Ellsworth the equipment was trucked over the road about 90 miles to the site where construction was already under way. The second and final chapter in the world's first "atomic airlift" took place in July when other components were airlifted to Ellsworth.

The actual installation of the PM-1 will be accomplished by the crew of senior noncommissioned officers who completed a five month training program at Martin's nuclear facility in Middle River, Md. The 21-man crew has an aggregate of 80 years experience in nuclear power plant operation. After completing the 48-week Nuclear Power Plant Operators Course (NPPOC) at Fort Belvoir, Va., the group trained on

PM-1 operations from January to June, 1961, in preparation for assignment to Sundance. Consisting of 17 airmen, two Army enlisted men, and two naval ratings, the crew is working under contractor supervision in installing the plant, conducting low power tests, and a six-month performance test.

In addition to the formal training under engineer-instructors on such items as reactor coolant systems, nuclear instruments, steam generation, turbine generator operations, and health physics, the military crew actively assisted in the pre-shipment test program at the Martin plant. Working with the Martin engineers they assisted in the verification of preliminary technical manuals and procedures.

Senior Master Sergeant Clarence D. Feierabend is NCOIC of the crew.

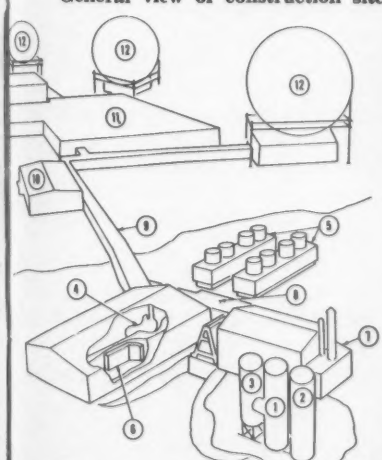
Future applications for the PM-1 already envisioned would provide heat and electrical power for sustained periods in combat and defense operations centers. One possible use of the PM-1 is provision of lengthy "button-up" capability. Generating electricity wholly independent of outside power, upgraded versions of the PM-1 would allow combat operations centers, Sage sites and other hardsite installations to stay in action despite any loss of commercial power. Since a nuclear reactor is a non-air-breathing system for generator electric power, the use of nuclear power plants would give such centers the same "button-up" capability possessed by nuclear powered submarines.

The service test of the world's first air-transportable nuclear plant promises to be a severe one from the standpoint of environment, since 6,650-foot Warren Peak gets an average of more than 100 inches of snowfall a year and has experienced temperatures of more than forty degrees below zero.

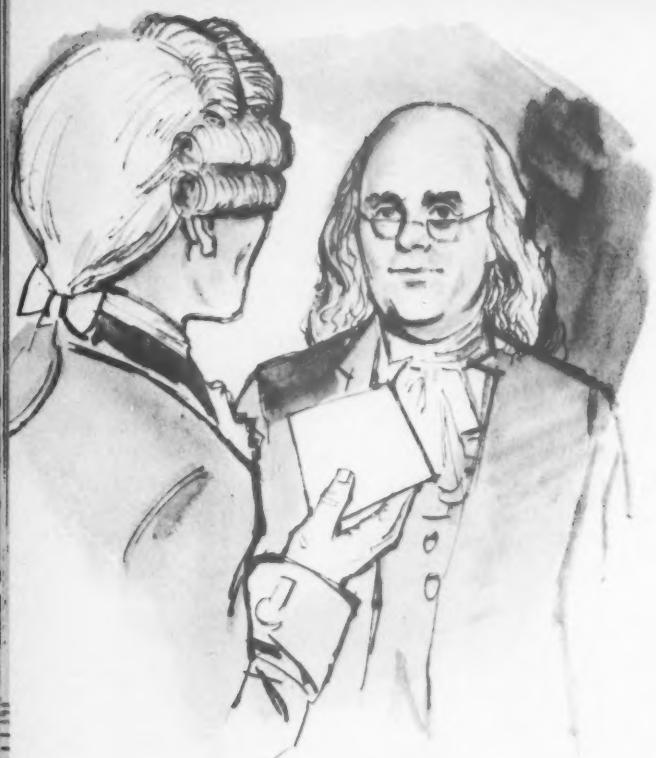
Pour some more U-235 on the fire.

Installation of PM-1 will be accomplished by a crew of senior noncommissioned officers from Army, Navy, Air Force.

General view of construction site at Sundance where nuclear power will provide energy for electric generator.



1. Reactor Tank, 2. Steam Generator Tank, 3. Spent Fuel Storage Tank, 4. Steam Turbine and Electric Generator, 5. Air Steam Condensers, 6. Control Console, 7. Shield Water Cooler, 8. Decontamination and Water Chemistry Laboratory, 9. Covered Walkway, 10. Base Technical Supply Bldg., 11. Base Operations Bldg., 12. Radar Installations.



He Started It

CONCLUSION

by WILLIAM A. KINNEY, Airman Staff

WHEN LOUIS BLERIOT piloted the first airplane across the English Channel July 25, 1909, he made spectacular front-page news. Close to six years had elapsed, however, since the first successful powered flights of the Wrights at Kitty Hawk, N. C. Much had been learned about flying machines during the interim.

At the time Dr. John Jeffries and his balloonist, Jean Pierre Blanchard, made the first aerial conquest of the Channel January 7, 1785, less than two years had passed since the invention of their lighter-than-air vehicle. Only a few manned balloon ascents had been attempted. Knowledge about operational techniques and navigation could not have been much scantier.

The news that they had successfully made the trip from Dover in England to a risky landing near the French port of Calais in the amazing time of slightly more than two hours created a sensation.

As word of their feat spread rapidly through the neighboring countryside, it touched off a great wave of rejoicing. Even among peasants who had never seen or heard of a balloon there was proud jubilation.

Blanchard and Jeffries were first royally entertained by the gentry of the vicinity, then escorted in triumph to Calais to have the old port city at their feet for the next few days. The bulk of the attention and honors went to M. Blanchard for he was now a French hero home among Frenchmen. Jeffries was not slighted, but the admiration for him was incidental—he happened to be fortunate in being the dauntless balloonist's "companion."

So great was regional pride that authorities quickly busied themselves with plans for erection of a monument to stand in the forest clearing where the historic flight ended.

Accounts of the flight exist, some published within the next several decades, which state that Jeffries was an "American" participant, as if he were then a citizen of the newly independent Colonies in North America.

The monument is the best evidence on what authorities of the Calais area and Jeffries, himself, considered his true allegiance at the time. Duplicate inscriptions were graven on this memorial, one in Latin and the other in French; in both languages the physician is identified as a British subject (viz., *Britannus* and *Anglois).*

Calais did itself proud in its acclaim for the two aerial conquerors of the Channel. However, the ancient port could not hope to keep the two aerial pioneers long as honored guests. The French capital, storied City of Light, now awaited these celebrated men with impatient expectancy.

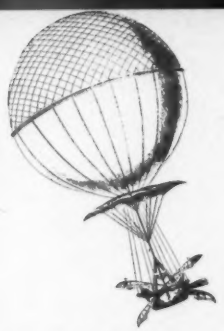
The pair reached Paris in the early afternoon, January 11. If Blanchard continued to be lionized by his fellow countrymen as the undoubted hero of the aerial victory over the Channel, there was no stinting in praise and attention for Jeffries as an indispensably courageous associate for the perilous venture. Receptions, compliments, honors crowded thick on the doctor virtually from the moment of his arrival.

That very first day, his diary records, was crowned by a gala banquet during which he was "greatly complimented." During the meal, Jeffries wrote, the banquet hall was invaded by a bevy of "French dames," bearing with them "a laurel crown, ornamented with ribbons, and embraced us again and again, and chanted some verses honorary to our aerial voyage."

He was prompted to add a three-word summary which smacks of understatement: "At Paris *incontestibly*."

And incontestibly he was. For the six weeks he was pleased to tarry in the city, his diary chronicles such a crowded round of engagements and activities that one marvels that he bore up so well under such a hectic pace.

Within 24 hours after his arrival, Jeffries was presented to King Louis XVI and received the monarch's admiring congratulations. Later he had an audience with the Queen, beauteous Marie Antoinette, who repeatedly complimented him. In a still mercifully veiled future, both this royal pair were destined to die by the guillotine after the eruption of the French Revolution



some four years later. And a like fate was in store for many of the prominent personages who vied to do the Boston physician honor.

The Paris of 1785, however, was a city of gaiety, opulent court life, grace and learning in those circles where the expatriate Bostonian moved. As a visitor, he was not likely to come by details of the nation's deteriorating financial position, ultimately a major factor in the onset of the Revolution. It is ironic that loans to the American Colonies after 1776 and then large outlays for open French intervention in our Revolution rank among the causes for the financial drain.

While Jeffries' ceremonial and social commitments were heavy, as might be expected, he seems to have availed himself of every opportunity to get acquainted with French scientists of note, artists, writers, men of eminence in his own field of medicine and other personalities of note. The doctor's command of the French language stood him in good stead.

Among the various new associations he made and enjoyed was one rather unexpected in character for a man of his proven loyalist background. Although he did not anticipate it at the time, a crucial decision would confront Dr. Jeffries before the decade was out. The possibility that this new association exerted a subtle, if profound, effect on how he would resolve the decision when the hour came is most intriguing.

The first hint of the association that developed appears in a casual notation Jeffries included in a lengthy diary entry for January 14. He mentions the receipt of a "very polite letter" from two staff members of the only diplomatic mission the United States had in all Europe, a mission astutely directed by Dr. Benjamin Franklin.

However "polite" the letter, its signers could only be identified with a cause already sadly depleted in prestige abroad. Four years after Yorktown the situation of the 13 original states had become so precarious it was dubious they could survive together with their recently won independence. No constitution yet bound them purposefully together in peace. European envoys reported bluntly on the ineptitude of the helpless governing system permitted to prevail across the Atlantic. A loyalist who had served with His Majesty's forces against them should have seen no inducement for fraternizing with representatives of the self-proclaimed new nation.

In the case of Dr. Jeffries, however, it did not turn out that way.

That January 14 was another extremely busy day for the physician, but he did manage his first opportunity to call on the English Ambassador, the Duke of Dorset, and pay his respects. One almost expects the account of the rest of the doctor's heavy schedule to conclude on the note of and-so-to-bed. But no, it ends with these surprising words:

". . . then to Dr. Franklin at Passy; very hospitably and kindly received." And so met these two natives of Boston, born almost 40 years apart—Benjamin Franklin, editor, scientist, statesman, diplomat and patriot; and John Jeffries, M.D., pioneer in scientific atmospheric and aeronautical research aloft, author of the first work published on the problems of flight.

Passy, scene of the meeting, has been described by Franklin as "a neat little village on a high ground, half a mile from Paris, with a large garden to walk in." Poor Richard had picked it for the location of his headquarters soon after getting to France late in 1776.

It was an extraordinary meeting, in one sense, and particularly for the friendly, congenial atmosphere Jeffries reports. Throughout our Revolution, Dr. Franklin's attitude toward American-born loyalists had been implacable. That independence had been won without or despite them was not calculated to soften his feelings about Tories in general.

Nevertheless, the occasion came off extraordinarily well. Good proof is that Dr. Jeffries' diary for the very next day has him again at Passy for "Dinner with Dr. Franklin . . . and a number of ladies and gents." And he would return.

As for Poor Richard, he was both surprised and pleased that in his initial visit the physician had delivered to him a letter from some correspondent in England—"the first through the air," the diplomat exulted. It had been in the packet of mail ferried by the balloon.

If the first encounter of the two men may be regarded as exceptional because of their clashing political loyalties, it becomes something less than remarkable viewed in another light. To Franklin any progress in basic science belonged to all civilization, and those advancing the cause of research were above any irritations which might set nations at odds. Moreover, Franklin may unwittingly have had a remote hand in the train of events leading up to Jeffries' exploits.

When the brothers Montgolfier staged their first balloon ascent for the benefit of Paris in late August, 1783, Franklin promptly dispatched a report on the event to an old London friend, Sir Joseph Banks, of the Royal Society. (What matter if the Peace Treaty with Britain ending the Revolution had not yet been concluded?) In his letter, Poor Richard suggested that the new lighter-than-air vehicle might open "the way to some discoveries in natural philosophy of which at the present time we have no conception."

Franklin, it should be noted, had been an honored member of the Society since 1756 and had since won wide international recognition for his contributions toward better knowledge of the physical sciences.

Franklin's suggestion, coming from one with his eminent reputation, was not something to be dismissed

routinely. As eventually turned out, when Jeffries before long made his own proposal for trying balloon flights in the interest of scientific studies, this same Sir Joseph Banks proved one of the most receptive members of the Royal Society in cooperative planning for the project.

Within a week after his first meeting with Poor Richard, Jeffries had another invitation to dine at Passy, "a most delightful" place he had decided. Among those at table with him this time was the Revolutionary naval hero who had given His Majesty's ministers many bad moments by boldly bringing the sea war into England's home waters.

The fellow guest, he wrote admiringly, was "the celebrated and brave Commodore (John) Paul Jones, from whom I received my compliments on my enterprise, and returned them, he deserving them more than me" for exploits in the Revolution.

Jeffries and Jones found themselves thrown in each other's company a number of times after that at social events elsewhere, for the presence of both men was much sought after in Paris circles. The diary also mentions meetings from time to time with various members of Dr. Franklin's staff, some obviously by chance, some probably not, for reasons which will be apparent.

The enjoyable visits to Passy continued, and then came the climactic one as Jeffries was about to leave Paris for England. Besides members of the American colony with whom the physician had already become acquainted, dinner guests included such VIPs as that ardent advocate of the Revolution, John Adams, future second President of the U. S.; the Marquis de Lafayette, gallant Frenchman who had fought and bled with the Continental Army; Col. David Humphreys, late *aide-de-camp* to General George Washington, "and several other gents of rank and note," not omitting John Paul Jones.

Despite the strong pro-American sentiments of almost everyone present, the expatriate loyalist had an "uncommonly" good time at the gathering before he finally "took leave of the venerable old Dr. (Franklin) and received many compliments, with his best wishes, &c."

The attentions accorded Jeffries at the American Mission may seem, at first glance, like a mere repetition of what all eligible Paris was eager to lavish on this current celebrity for his daring successful aerial voyage. The Passy story, however, holds something more.

While Paris was in its first transports of enthusiasm and acclaim for the two men, Franklin realized that Blanchard, the balloonist, was faring very well, definitely much more so than his companion who had not only conceived the flight project but also defrayed its high expenses.

It was not simply a question that Blanchard was reaping the most glory. That the French would exhibit greater favoritism toward one of their own countrymen was human and understandable. But Blanchard was also reaping substantial material rewards to supplement the glory. The King lost no time in bestowing on him a purse with a goodly sum of money and also the grant

The monument in the forest clearing where the flight ended.

of a pension for life. With the Monarch setting a bountiful example, others were moved to emulate him in their fashion.

As for Jeffries, there were no dearth of honors, among them some a man of his intellectual attainments would greatly prize, and he already possessed the important psychic compensation that derives from achievement attained. Franklin could fully appreciate the value of the latter to an individual, but he was not persuaded that achievement should therefore go without material recognition.

Thus, Poor Richard found it hard to accept that England would make no simultaneous move to provide for Jeffries something comparable to the generous rewards that France heaped on Blanchard. Yet, back across the Channel any promising signs for such action were lacking. Franklin set himself to try to redress this situation which he viewed as unfair.

After Dr. Jeffries' preliminary contacts with members of the staff at Passy, the suggestion was broached to him that he, too, well merited from the British Crown a tangible expression of recognition. The physician was not unreceptive to the idea. Next, aides of Franklin sounded out the English Ambassador to France and he proved well disposed about helping advance the proposal for a monetary award or pension.

From the American Mission a number of letters were dispatched to prominent members of Parliament in London and other distinguished Britons, seeking to enlist their influence in the cause. Among the correspondence was an appeal from Franklin that the Royal Society confer on Jeffries a life membership, free of all expense. This whole demonstration of unselfish solicitude that the physician should receive his

just due was a memorable experience for the expatriate Bostonian.

Jeffries ended his stay in Paris February 21 and proceeded leisurely back to England. He paused for a few days at Dover, where the Channel flight had begun, and his welcome there was heart-warming. On March 5 he finally reached London, where he began his second paper for the Royal Society.

In this report, he acknowledged anew his nonprofessional status in the various scientific disciplines affecting the exploratory research of the two balloon missions. However, he did represent himself modestly —and mostly by indirection—as being an alert, systematic observer, if "unaccustomed to write for the public eye."

Near the close of the paper, he mentioned some of the distinctions, gifts and financial rewards France had heaped on M. Blanchard for his part in the aerial conquest of the Channel. Yet Jeffries ignored the opportunity to make any plea, however oblique, for like treatment.

From what we know, it would appear that resuming life in metropolitan London held for Jeffries all too many features of an anticlimax. After the elation of the spirit from pioneering achievements, the hours of high adventure, the heady adulation in a foreign land, he found awaiting him at journey's end no urgings or inducements to press onward as a Columbus of atmospheric exploration. Only prosaic, earthbound routine beckoned.

The physician prudently applied himself again to medicine and presently rebuilt his previous flourishing practice. His professional income had been negligible since he first became engrossed many months ago with plans for his maiden aerial flight. The financial outlays for this and then the Channel project had been heavy. His sojourn in France was scarcely an inexpensive interlude. And all this lengthy while there had been a family to support and a fashionable residence to maintain. The matter of seeing to a livelihood required attention.

Some months after the Royal Society finally heard the physician's two papers read, they appeared in book form, entitled: *A Narrative of the Two Aerial Voyages of Doctor Jeffries with Mons. Blanchard,* carrying Jeffries' name as the author. Publication was sanctioned by an Act of Parliament, April 3, 1786, but the work was printed at Jeffries' expense.

The papers contained proposals for several balloon flights annually for scientific research and a recommendation on how to finance them. The program failed to arouse enough active support.

Dr. Jeffries' medical practice, meanwhile, had grown and become more lucrative. Yet the erstwhile Bostonian was less than contented. Inexorably, he drew closer to the hour of great decision.

Without a far more precise knowledge of all the relevant considerations than remains available to us today, it would be gratuitous to cite any particular set of reasons as holding the full explanation for the action he was moved to take.

Even so, there would appear to be legitimate grounds for conjecture that the seed of at least one of the influences at work began to germinate at Passy in 1785 after the Channel flight. It was at Passy that, for the first time since the Revolution, he was thrown into cordial, then intimate association with former fellow countrymen. And he wrote of the experience in the vein of a man feeling unexpectedly at home. The sincere and selfless concern of Benjamin Franklin in his behalf alone might have been enough to make Jeffries' reflective, inquiring mind take further thought.

Whatever the origin of the intellectual reappraisal, the year 1789 brought its culmination. The expatriate foreswore the allegiance he had given the British Crown all his life, in peace and in war, and returned to his native Massachusetts to become John Jeffries, M.D., U. S. citizen.

In Boston where he had first hung out his shingle as a young doctor just 20 years earlier, he rejoined the medical fraternity and gained eminence as one of the city's most prominent physicians and surgeons. He died there September 16, 1819.

It has been the lot of too many bygone Americans of inspirational accomplishment to have their stories all but disappear in an historical limbo until their names cease to have any meaningful connotations.

Happily, this should not be the case with the Boston doctor. When the Institute of Aerospace Sciences decided to confer special honor annually on individuals responsible "for outstanding contributions to the advancement of aeronautics through medical research," the organization fittingly chose to name the recognition the John Jeffries Award. Dr. Jeffries should be pleased.

INSTITUTE OF THE AEROSPACE SCIENCES
THE JOHN J. JEFFRIES AWARD
Presented for outstanding contributions to the advancement of aeronautics through medical research

RECIPIENTS: Dr. Louis H. Bauer; Maj. Harry G. Armstrong, U. S. Army (MC); Dr. Edward C. Schneider, Wesleyan University; Brig. Gen. Eugen G. Reinartz, AAF; Air Marshal Sir Harold E. Wittingham, RAF; Comm. John C. Adams, USN; Brig. Gen. Malcolm C. Grow, AAF; Dr. J. Winfred Tice, RCAF; Dr. W. Randolph Lovelace II, Lovelace Clinic; Col. A. D. Tuttle, United Air Lines; Brig. Gen. Otis O. Benson, Jr., USAF; Capt. John R. Poppen, USN (Ret.); Lt. Col. John P. Stapp, USAF; Capt. Charles F. Gell, NADC; Dr. James P. Henry, USAF; Capt. Wilbur E. Kellum, USN; Ross A. McFarland, Harvard University; Maj. David G. Simons, USAF; Dr. Hubertus Strughold, USAF; Brig. Gen. Don Flickinger, USAF; Capt. Joseph W. Kittinger, Jr., USAF.

LETTERS TO THE EDITOR, continued

Dietetic Inquiry

Sir: In *Airman's World* (June '61), I noticed a brief article telling of the establishment of a dietetic school. Please give me as many details as possible as I am most anxious to apply for entry into such a school.

A1C Charles F. Jones
Minot, N. Dak.

● *According to the best information currently available to us, the course in question is presently restricted to female personnel. As to the possibility of accepting male students in the future, we suggest you keep in touch with your personnel officer who should have the latest information readily available.*

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The Last Word

Sir: In your *Letters to the Editor* column (page 41, June '61), you fail to show the latest information on the guest house-government quarters controversy. The *Accounting and Finance Tech Digest*, Volume IX, No. 14, dated 7 April '61, on page 4, Item 8, states: "Change 6 (effective 15 March '61) to AFM 177-105 has been published and is being distributed. A change thereto, worthy of your notice, is that the holdings of the Comp. Gen. in Decision B-143506 (28 December '60) have been included. These provide that basic allowance for quarters is payable for date of termination of government quarters."

MSgt. Donald Hathway
Pope AFB, N. C.

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Whoops

Sir: The illustration which accompanied the article *Cheating the Killer (Airman's World*, June '61) indicated the victim was wearing several stripes. The article, on the other hand, identified the victim as an airman basic. Who are we to believe?

A1C William L. Carl
Offutt AFB, Nebr.

● *Believe the author. Unfortunately, the artist did not have the authority to promote the airman.*

Clarification

Sir: I recently became aware of a practice for which I would like an explanation. I understand that Civil Air Patrol Cadets automatically receive a stripe at the time they enlist in the Air Force. Can you explain why this should be so?

A3C Paul A. Krechman
Griffis AFB, N. Y.

● *As an auxiliary of the Air Force, Civil Air Patrol members benefit from their association with this service. However, not all CAP Cadets automatically receive a stripe upon enlistment in USAF. Those who complete a rigid course of instruction, attend a summer encampment and pass a national examination are awarded a certificate which the Air Force honors with an airman third class stripe when the recipient enlists. The course includes such subjects as the theory of flight, navigation, meteorology, air traffic rules and related aviation subjects—all exceedingly useful in an Air Force career. The exam is to test proficiency in these subjects and must be successfully completed before such a certificate is issued.*

a mark of distinction

When President Kennedy's MATS-operated jet transport landed in Paris, London, and Vienna early this summer only the familiar white star in a blue circle with red-lined white side tabs marked it as a military plane.

Oddly, this insigne without its present modification was officially adopted by the Aeronautical Division of the Signal Corps to identify all military aircraft in May 1917—the same month and year that President John F. Kennedy was born. It was designed by the starry-eyed 1st lieutenant in the World War I uniform.

When he got the idea for the insigne Roland S. "Swede" Knowlson was only a private learning to fly a Curtiss "Jenny" as a member of the 1st Aero Company of the New York National Guard. His outfit was the first Guard unit called into Federal service. Swede sold the design idea to his Company Commander, Capt. R. C. Bolling (for whom Bolling AFB is named), and was assigned the job of painting the insigne on the wings of all 13 of the company's "Jennies." Private Knowlson skipped squad drills for two months to complete the job.

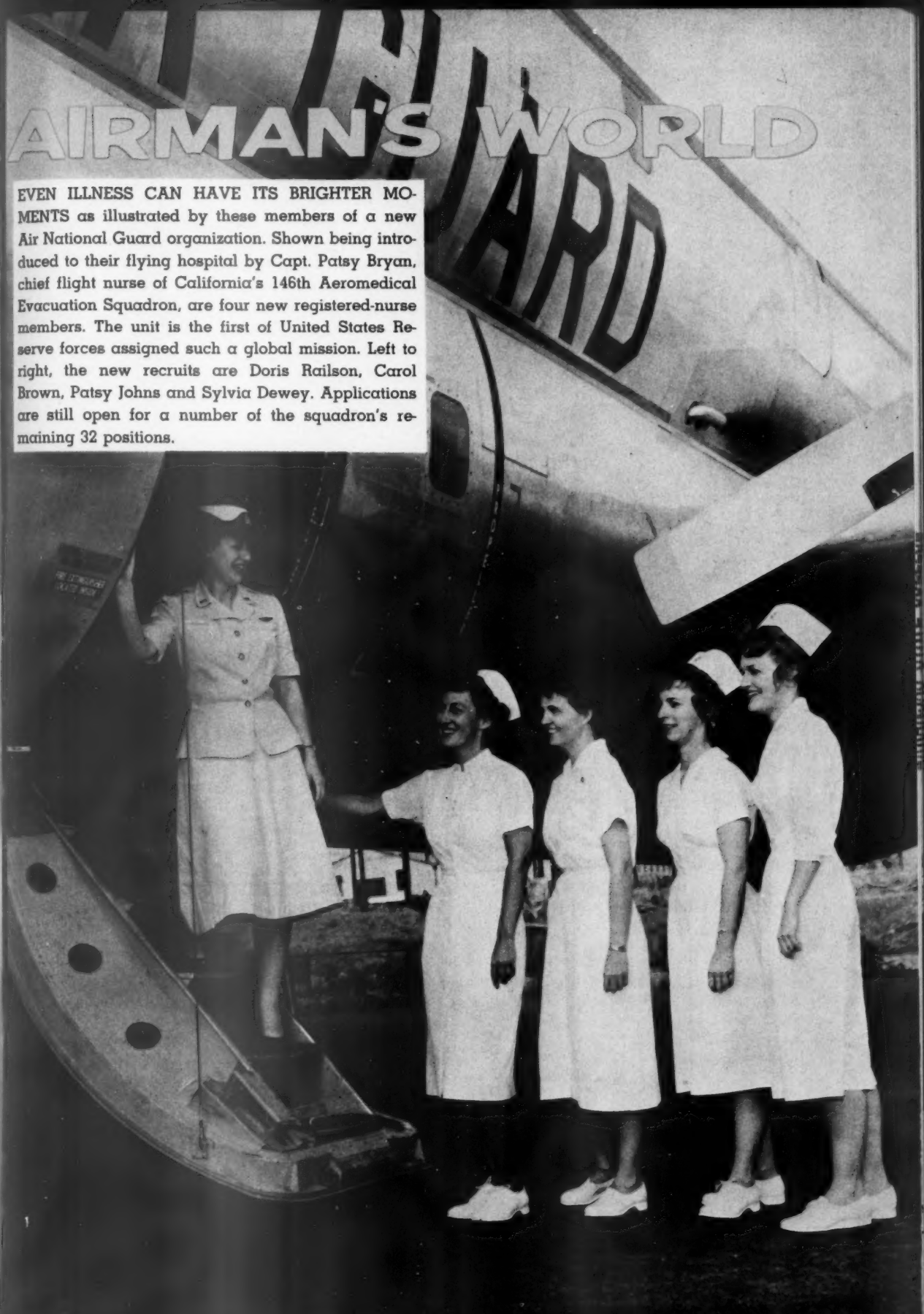
The original design—a red disk in a white star within a blue circle—marked all U.S. military aircraft from 1917 until 1941. Then the red disk was removed to keep it from being confused with the red "meatball" of the Rising Sun that identified Japanese war planes. The red-barred white side tabs were added just a few months later to make the insigne still easier to identify and harder to copy by the enemy.

Swede Knowlson was discharged in 1917 to become a civilian flying instructor for the Army but was recalled as a 1st lieutenant for another year in 1918. He always resented the fact that he didn't get overseas in WW I.

Like most other WW I pilots, he barnstormed for a couple of years. Then, in 1920, Knowlson became Aviation Editor of the *Kansas City Star*. For the next 30 years Swede Knowlson wrote the history of aviation's advances across the pages of the *Star* except for a brief two-year stint as publicity director for an international airline.

Swede Knowlson, member of the "Early Birds" and "The Quiet Birdmen," witness, interpreter, and writer of aviation history, died in the Veterans' Hospital at Fayetteville, Ark., at the age of 64. But he left his mark—an insigne known and respected throughout the world, painted on the side of the Presidential aircraft, aerospace craft, and U.S. military planes. And a symbol worn as proudly in the center of his chevrons by every enlisted airman in the U.S. Air Force.

AIRMAN'S WORLD



EVEN ILLNESS CAN HAVE ITS BRIGHTER MOMENTS as illustrated by these members of a new Air National Guard organization. Shown being introduced to their flying hospital by Capt. Patsy Bryan, chief flight nurse of California's 146th Aeromedical Evacuation Squadron, are four new registered-nurse members. The unit is the first of United States Reserve forces assigned such a global mission. Left to right, the new recruits are Doris Railson, Carol Brown, Patsy Johns and Sylvia Dewey. Applications are still open for a number of the squadron's remaining 32 positions.

DESIGNED AND BUILT by members of SAC's 33rd Communication Squadron, March AFB, Calif., this cryptography operations control console is currently being adopted as part of the command's standard equipment inventory. It will provide an oral alarm to indicate any malfunction that might occur in cryptographic equipment during normal transmission. Lt. Leland B. Tainter, Jr., (left) project officer for production of the hand-made units, is assisted by MSgt. Bob Farabee in a final check on one of the completed units. They will be installed in key installations around the world as they become available.

Facet-Eye Camera

A camera capable of registering planet images not visible to the naked eye is in use at AFSC's Air Force Missile Development Center, Holloman AFB, N. Mex.

Consisting of 19 long-barreled, five-inch refracting telescopes, the Facet-Eye camera records impressions on an equal number of TV-like image-orthicon tubes. Its basic purpose is to track missiles, satellites and other space-bound objects at extreme distances in any kind of light.

In terms of daytime detection, it is now possible to record images to the sixth stellar magnitude. Roughly, this means that detection is now possible under daylight conditions which is equal to the ability of the naked eye at night.

The highly sensitive instrument was developed in AFMDC's Orbital Mechanics Division and built by International Telephone and Telegraph Laboratories, Fort Wayne, Ind.

Inter-Service Project

Edwards AFB, Calif., is hosting an unusual inter-service test program. Currently involving USAF, the Army, and Navy, the end product is scheduled for use by the Forestry Service.

Trigger for the program was one of California's most critical and costly problems—forest fires. For several years, the Forestry Service has utilized WW II Navy TBM torpedo bombers to deliver 600-gallon borate bombs in their aerial fire-fighting program. Recently, however, these planes have been involved in a series of disasters.

As a result, the problem was placed in the hands of the Army Aviation Test Office. In turn, these officials requested USAF permission to utilize the Edwards facilities in revamping and reinstrumenting the ex-Navy bomber. Aim of the program is to eliminate current bugs and return the TBM to its civilian duties as a far safer fire-fighting platform.

Bits of Blue

. . . USAF's Officer Candidate School and Headquarters, Officer Military Schools, are in the process of relocating their activities from Lackland AFB, Tex., to the former Atomic Energy Commission installation at nearby Medina, Tex. The Officer Training School moved into the same base in June.

. . . WW I had its pigeon hero in John Silver and, despite 25 years of progress, WW II also had these feathered standouts. One was G. I. Joe, who saved more than 1,000 British soldiers from aerial attack by their own aircraft. He died recently at his "home" in the Detroit, Mich., zoo.

. . . Eglin AFB, Fla., plays host to USAF's worldwide golf tournament later this month. Championships will be at stake in three divisions—women's, open and senior men's. The latter must have reached the age of 45 to qualify in this division. Golfers will tee-off on September 19 for the week-long meet.

. . . The second annual Armed Forces Chess Competition will be held in Washington, D. C., beginning September 23. The meet is jointly sponsored by the United States Chess Federation (USCF), American Chess Foundation (ACF) and the United Services Organizations, Inc. (USO).

New Fiber

USAF's Air Force Systems Command is currently testing a new heat-resistant organic fiber which may have wide utilization in many areas in tomorrow's air travel.

Designated HT-1, the new fiber extends the useful range of organic fibrous materials to 550 degrees Fahrenheit as opposed to the 482 degrees at which nylon melts. Also, it is so versatile that it may be applied in any area where such temperature ranges can be expected.

Among these many possible applications are aircraft tires; decelerator parachutes, for standard aircraft as well as space craft; personnel parachutes and packs and military clothing.

In its most impressive test to date, a nylon chute was packed in an HT-1 container and exposed to the direct flame of JP-4 and 100-octane gasoline for 12 seconds. The chute, although slightly damaged, was still usable after the flames were extinguished. Other chutes, in standard packs, were rendered worthless under similar exposure.

Specialized Training

An agreement to permit USAF training flights at the Pueblo, Colo., Memorial Airport recently triggered a study in voluntary military-civilian cooperation.

As a standard precaution, the 4600th Air Base Wing, Ent AFB, Colo., detached a permanent fire-fighting unit for duty at the airport. However, to assure that such protection would be around-the-clock, the Pueblo Fire Department agreed to assist in manning the engine.

As a result, a special training group of Ent airmen devised a short course in fighting aircraft fires, then traveled to Pueblo to instruct the civilian volunteers. They will be integrated into military crews and on-the-job training will continue until the Pueblo Department employees have attained complete proficiency.

THE AIR NATIONAL GUARD'S Lt. Robert F. Brunner is currently making news in the nation's music world. Leader of the 562d Air Force Band, attached to the 146th Air Transport Wing, California ANG, Lieutenant Brunner recently received a $1,000 cash award for his *Scherzo*, composed for a 100-piece symphonic orchestra. The composition will be premiered next month at Los Angeles Shrine Auditorium—under the baton of Bob Brunner.

REFUELED AND READY TO GO, these F-100s from Myrtle Beach AFB, S. C., are ready to leap away from USAF's largest portable refueling complex. Shown here are five of the smaller tanks, each with a capacity of 10,000 gallons. Latest to join the complex is "Papa," a 50,000-gallon giant. The pillow-portables were fabricated by Goodyear and have been utilized in recent TAC exercises.

Cooperation

Teams from three U. S. agencies are currently conducting research into methods of predicting and minimizing the effects of sonic booms.

Inaugurated in July, the study is expected to continue for approximately six months and will be divided into four specific areas: sonic boom generation and propagation, design considerations to minimize sonic boom intensity, operational procedures to minimize sonic booms, and effects of sonic booms.

Air Force B-58, F-104, F-105, and F-106 aircraft are being utilized as test vehicles, and several USAF bases, including Stead AFB, Nev., and Edwards AFB, Calif., are serving as project stations.

The cooperating agencies are USAF, the National Aeronautics and Space Administration (NASA) and the Federal Aviation Agency.

A Gift of Sight

Members of the Square and Compass Club, Kunsan AB, Korea, have just cause to be doubly proud of their recent humanitarian efforts.

In the spirit of Masonic tradition, the organization recently agreed to extend a special effort in behalf of the youngsters who live in a nearby blind and deaf school. Doctors were asked to examine the handicapped and determine if medical assistance would aid them.

Local military doctors determined that three might be helped through surgery. Kyong Su Pak, a 14-year-old, blind since birth and orphaned during the Korean conflict, was selected as the first recipient of the program. The Masons then raised the necessary money for expenses and transportation for the youngster and an escort and made arrangements for the operation at the U. S. Army hospital at Ascom City.

The cataract operation has now been termed a complete success and young Kyong has been fitted with special glasses to further aid his sight. The other two youngsters will be treated as soon as necessary arrangements can be completed.

FORMAL OR INFORMAL, when the bell rings, the Reserves are ready. A practice alert of the 149th Tactical Fighter Squadron, Virginia Air National Guard, caught a number of its members in a variety of pursuits. R. Caswell Cooke, Jr., an airman third class, who is the gentleman in formal attire, was ushering at his sister's wedding. Capt. John K. Taylor (in shorts) was picnicking. Behind Airman Cooke is 2d Lt. James DeJarnette IV. The postmaster of Aylett, Va., SSgt. Thomas Simpkins, follows Capt. Taylor. Despite their diverse activities 28 percent of the unit, which is based near Richmond, reported for duty within an hour after the alert sounded.

Junior Air Force

Three young local lads were recently treated to a full day as guests at Griffis AFB, N. Y.

The honor was a reward for their alertness and honesty which resulted in USAF's recovery of an F-101 landing-gear cover which dropped from an aircraft during a takeoff.

The youngsters—David and Donald Briggs and Thomas Percival—found the cover while playing on the shores of a nearby lake. They called the base and reported their find. In appreciation, the lads were guests of base personnel for an entire day and were awarded *Voodoo* "Scope Wizard" patches to indicate they are honorary members, in good standing, of the 49th Fighter-Interceptor Squadron.

Testing Schedule

Specialty Knowledge Testing (formerly Airman Proficiency Testing) for the current month will include 11 career fields. Overseas testing will be conducted during the week of September 4; ZI testing the following week. Air National Guard and Reserve personnel may take SKTs anytime during the month.

The skills which will be examined include 20 (Intelligence), 24 (Safety), 27 (Air Traffic Control and Warning), 29 (Communications Operations), and 31 (Missile Guidance and Control Systems).

Also 46 (Munitions and Weapons Maintenance), 47 (Motor Vehicle Maintenance), 56 (Utilities), 60 (Transportation), 62 (Food Service) and 73 (Personnel).

Air Age Library

From time to time a publication comes to our attention which we believe to be of above normal importance to Air Force people. The *Uniformed Services Almanac* is such a book.

Published by the *Federal Employees News Digest*, this handy little paperback contains a wealth of information. Priced at $1.00, it is available by mail from Uniformed Services Almanac, P. O. Box 400, Washington 4, D. C., or in base exchanges.

The 146-page booklet covers just about everything a serviceman needs to know—from the Medicare program to pay and allowances.

It contains 25 major headings and innumerable minor breakouts within these areas. Almost every conceivable military subject is covered in minute detail and answers and explanations are clear and concise.

The *Almanac* is published on an annual basis and revised copies are normally available shortly after the start of each calendar year.

PROFESSIONAL READING

The editors of the *Army Times* have authored a comprehensive *History of the United States Signal Corps*, released by G. P. Putnam's Sons ($5.95). The historical narrative is well written and more than 100 pictures help to illustrate the text.

MISSILES AND SPACE

Dr. S. D. Sells and Lt. Col. Charles A. Berry of the Air Force Medical Corps have edited *Human Factors in Jet and Space Travel* (The Ronald Press, $12.00). It deals primarily with aeromedical problems introduced by high-speed and high-altitude flight and relates these to similar problems in future space travel.

In the same category is *Aerospace Medicine* which contains articles by Maj. Gen. Harry G. Armstrong (USAF, Ret.) and 21 contributors (William and Wilkins, $18.00). This work presents a detailed treatment of the medical aspects of 32 areas of aerospace medicine.

Henry B. Lent treats with a similar subject in *Man Alive in Outer Space* (MacMillan, $3.00) in which he details the story of USAF's aerospace surgeons.

Initial success of *Project Mercury* has triggered two new books — Martin Caidin's *Man Into Space*, a paperback released by Pyramid Books (.50), and *The Astronauts* by Don Myrus (Grosset and Dunlap, $1.95).

You Ask It

In answer to numerous requests, here is a rundown on new manuals and regulations and recent changes thereto in areas of widest Air Force interest.

Manuals

AFM 35-11, 20 June 1961, *Airman Classification Manual.* Major changes which become effective during the current month.

AFM 35-2, 22 June 1961, *Occupational Analysis.* Establishes policies and describes procedures for surveying and evaluating Air Force specialties.

AFM 35-8E, 11 May 1961, *Air Force Military Personnel Evaluation Manual.* Contains information regarding the change from proficiency testing to specialty knowledge testing.

AFM 36-1E, 20 June 1961, *Officer Classification Manual.* Major changes which become effective during the current month.

AFM 36-10A, 25 April 1961, *Officer Effectiveness and Training Reports.* Outlines several changes to Part Two, Officer Effectiveness Reports.

AFM 39-9F, 20 June 1961, *Enlistment and Reenlistment in Regular Air Force.* Contains changes in educational requirements for persons enlisting without prior service.

Regulations

AFR 32-2, 15 June 1961, *Ground Accident Reporting and Analysis Procedures.* Contains information on how to collect and evaluate accident data and establishes minimum requirements of the Air Force ground accident reporting system.

AFR 34-14A, 23 June 1961, *Air Force Aero Clubs.* Contains important changes in procedures for accident reporting for such organizations.

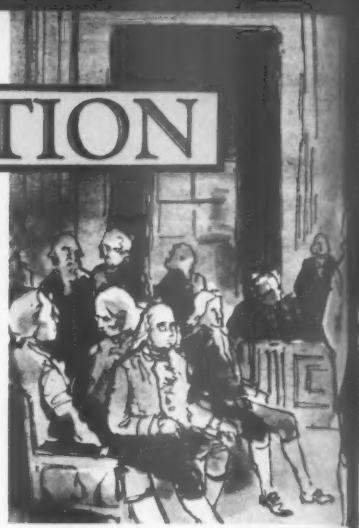
AFR 35-73A, 27 June 1961, *Absence Without Leave and Desertion.* Supersedes Change A of 15 December 1959 and includes extensive changes in policies concerning apprehension and disposition of offenders.

AFR 50-31, 21 June 1961, *Moral Leadership.* Stresses the importance of moral leadership and provides guidance for accomplishment of this factor.

AFR 111-12, 23 June 1961, *Apprehension, Arrest and Confinement.* Outlines authority and procedure for apprehending, arresting and confining persons subject to the UCMJ. Also informs USAF members of their right, under certain conditions, to apprehend persons not subject to the UCMJ.

AFR 160-102A, 28 June 1961, *Prevention and Control of Communicable Diseases of Man. Immunization Requirements and Procedures.* A change in requirements with regard to influenza immunization.

YOUR CONSTITUTION



by WILLIAM A. KINNEY, Airman Staff

The Declaration of Independence in 1776 has been likened to a stirring trumpet call. It heralded the radical new political philosophy of "unalienable rights" and that governments derive their just powers only from the consent of those they are created to govern. It rallied embattled patriots to endure through the long, grim military ordeal ahead.

July 4, the date of the Declaration's adoption, we celebrate as our National Holiday. The scene in Independence Hall at the signing conjures up for us the most vivid and proud picture in all American history.

If we officially date our nationhood from July 4, 1776, then we should rank September 17 as an anniversary of unsurpassed importance, for on that Monday in 1787 emerged the inspired formula indispensable for our country's continued survival.

By coincidence, the setting on both occasions was the same—Philadelphia's Independence Hall. The second momentous assemblage there, with great perseverance and intellectual resourcefulness, succeeded in forging that unique instrument of government—the Constitution of the United States of America.

By proclamation, President Kennedy has designated the entire week of September 17-23 to memorialize the work of the Constitutional Convention, and the proclamation asserts it is a fitting time for citizens to review or acquaint themselves better with events related to the Constitution's origin.

The United States which won their Revolution did not constitute a nation as we understand that word, or even according to the precise definition of its 13 members. It was a "league of friendship" in the words of the Articles of Confederation under which the sovereign states banded in due time to make their struggle for freedom a common cause.

The Confederation had no hasty birth. The proposal for some such organization predated the Declaration of Independence. Not until mid-November 1777, however, did the Continental Congress pass a watered-down version, and this with the proviso it must be ratified by *all* the states. The last one got around to subscribing on March 1, 1781—only six months before the victory campaign opened against Yorktown—and the Continental Congress became "The United States in Congress Assembled."

If the title was new, the Congress gained very little in authority or stature by it. Each state jealously reserved to itself the maximum amount of power possible. Congress might requisition so many troops but only the state could recruit them. With money or military supplies, the story was the same. For commerce or interstate affairs, Congress could propose but could not enact regulations.

Congress was authorized to make treaties (yet without competence to have states abide by treaty provisions); to borrow money (without knowing how repayment would be financed); to deal with Indians beyond existing state borders (although with no military force ready at its bidding to use against them if need be).

Historians have referred to the Articles of Confederation as "a rope of sand." In retrospect, it is more than remarkable that such an unsubstantial bond served as well as it did through the black hours then onward into the dawn of Independence won.

And the coming of that bright dawn put the basic inadequacies of the Articles into a steadily more pitiless light. Nevertheless, the charter members of this "league of friendship" managed to eke out another six years within its flimsy framework, and some bridled at suggestions it might be changed for the better.

One harsh fact of life could not be ignored, however. Haphazard financing of the Revolution had put the "league" deeply in debt—the principal amounted to some $40 millions; interest was already $2 millions in arrears. Approximately one-fifth of the money payable involved loans obtained from France, the Netherlands and Spain—all countries of strength and all possessed of beachheads in the Western Hemisphere from which to mount punitive actions to collect, if necessary.

The insolvent "league" represented a total population of some 3,250,000, according to best estimates which exclude any figures on Indians. Out of this total only 400,000 adult males qualified as free men, presumably entitled to full political rights and subject to state taxation. As for the rest of the population, it included some 600,000 enslaved Negroes, 350,000 whites in various forms of servitude, plus the women and children of the free men.

For most of the 400,000 free men inflation had spawned a common nightmare, and resentment led to demonstrations, and in Massachusetts to internal disorders. Men of property grew fearful the situation would get out of hand and cost them their fortunes, earned or inherited.

During the Revolution the states issued their own

money and most of it had severely depreciated since. There were cases where the currency of one state was worth only a tenth, even a hundredth of its face value in the very few states whose monetary systems had been kept fairly stable. Hence, people of the latter states could make purchases at far less than bargain rates in depreciated currency areas while residents of those areas had to pay astronomical prices for goods the "hard" money states could provide.

When controversies arose between adjoining states over a matter of mutual interest, for example the terms of sharing a waterway between them, there was no final source for adjudication of rival claims.

The catalogue of selfishness, shortsightedness, and provincial intransigence is too lengthy for detailed enumeration. On the wall, however, the handwriting was plain—the states were becoming fragmented.

This steady decline aroused the utmost concern and fears for the future in the best minds of the country. "No morn ever dawned more favorably than ours did; and no day was ever more clouded than the present," wrote Washington gloomily in November, 1786.

After a series of meetings, conferences, and much correspondence, the thinking men who were tormented by anxiety about the country's future succeeded in enlisting enough support for the convocation of an assembly to study ways for amending the Articles of Confederation to cope with present and impending crises. May 14, 1787, was the date set for its opening.

Throughout all the preliminary maneuvering for calling a convention, the most influential figures were of one mind that Washington's presence would be essential if real progress were to be made. At first the General was reluctant to accept a place on the Virginia delegation, but many moving appeals to his patriotism and his own deep worry over worsening conditions finally led him to serve.

Philadelphia, the country's largest city with a population short of 30,000, gave the General a hero's welcome when he arrived on Sunday, May 13. An old friend, Benjamin Franklin, received him warmly.

On Monday Washington arrived promptly at Pennsylvania's State House, not yet renamed Independence Hall, for the Convention's scheduled opening session. To his surprised annoyance only Pennsylvania and his own Virginia were represented. Delegates dribbled in so slowly that it was Friday, May 25, before the necessary seven states could muster a quorum, thereby enabling the gathering to organize at last. A unanimous vote made Washington presiding officer. (It was almost the end of June before 11 states were duly represented. New Hampshire's belated two delegates did not put in an appearance until July 23. Rhode Island, alone, boycotted the Convention.)

A majority of the delegates were young, educated, and practical minded. Lawyers formed the largest professional group. Other members included merchants, planters, public officials, professors, and physicians.

By Monday, May 28, nine states were represented. The convention started work and in its first days the gathering decided that all deliberations should be kept secret.

By this controversial though not unprecedented action, the Convention has been charged with doing a disservice to history. Scholars have argued that lack of daily verbatim minutes has deprived the nation and all students of government of every detail relating to the Constitution's formulation.

Actually, we do possess a large fund of information about what happened. James Madison, the Virginian who was one of the chief architects of the document, kept a voluminous private journal on the daily proceedings and appears to have enjoyed the status of unofficial recorder.

Under the circumstances prevailing in 1787, however, it is difficult to contend that the secrecy decision was anything but a realistic one. The stated purpose for which the delegates had met was to amend the Articles of Confederation. The instructions some had from their states were fairly rigid in character. With other delegations, allowance was made for greater discretion. There were men with hopes that the Articles could be transformed somehow into a more effective arrangement. Others were convinced this was impossible, regardless of instructions. Still others were uncertain.

The Convention, too, could not escape being a forum where the differing individual interests of the various states, their political traditions, ambitions, fears, past disputes, and other special concerns would spark debate and contention. Any progress would require give-and-take; stalemates would mean compromise.

To have a delegate's position recorded and publicized on every vote taken had obvious disadvantages. If further debate changed his views, his motives might be impugned. Legitimate parliamentary maneuvering

would be paralyzed. Moreover, if suspicious states misjudged the trend of transactions at any point, they could recall their delegations, leave the Convention without a quorum, and liquidate its work. The issues involved were too delicate at this juncture to have deliberations plagued with harassments arising from incomplete or false accounts of their details.

Word of the secrecy provisions occasioned misgivings in large segments of the public and in top-echelon state officeholders throughout the states. Had the presiding officer been anyone less than George Washington, shining symbol of devotion to the cause of Independence, the rule may well have spawned trouble as the long weeks dragged on.

Second only to Washington in popular esteem was that venerable member of the Pennsylvania delegation, Benjamin Franklin. His presence and that of other well regarded revolutionary figures also had a salutary effect on discouraging outside interference.

On May 29, four days after organizing, the Convention was challenged to concentrate its energies on formulating an effective and equable masterplan for a truly national government rather than on attempting to shore up the ineffectual Articles of Confederation.

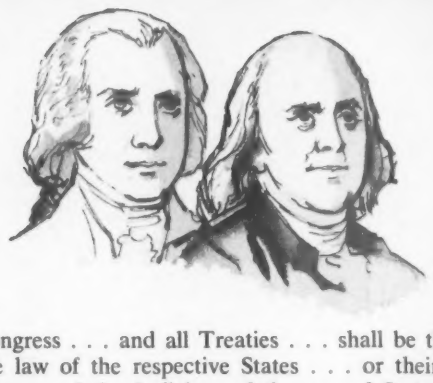
In this, Virginia took the initiative with the so-called Virginia Plan, offered in a series of resolutions by Edmund Randolph. It called for three equal branches—legislative, executive, and judicial. The legislative branch, as envisioned, would consist of two houses, with the representation of states on a basis proportional to their "free" population. The "first house" would be elected directly by voters. Members of the "second house," however, would be chosen by members of the "first house" on the same population basis, but without reference to any popular vote.

Together, so the proposal ran, the two houses would decide jointly whom should serve as the "National Executive," as well as select those to preside over the nation's courts.

Delegates of the small states feared apportionment of membership in both houses according to population would give the large states an over-riding whip. World history held many examples of leagues being formed to meet emergencies, only to have the bigger partners dominate the lesser ones after a crisis ended. They felt themselves being consigned to a permanent minority "say" not only on legislative matters, but also in the choice of "the National Executive" and personnel of the judiciary since these appointments would depend on the votes of the two houses.

New Jersey, "cockpit of the Revolution," spearheaded the attack on the Virginia Plan for the smaller states. The counter-proposal supported continuation of the single legislative body of the Confederation, with each state retaining equal voting status, but would empower the legislature to regulate foreign and domestic commerce and enforce its requisitions on states for financial support and military manpower.

One recommendation to strike fire in delegates' imaginations stipulated that "all Acts of the United States



in Congress . . . and all Treaties . . . shall be the supreme law of the respective States . . . or their Citizens . . . and the Judiciary of the several States shall be bound thereby in their decisions." This was a bold, new concept destined to be incorporated (under Article VI) in the Constitution as eventually adopted.

Nothing in the rest of the plan can be called constructive. It wanted the outmoded Confederation structure preserved, embodying the described reforms, and unrealistically favored having the responsibilities of any "National Executive" vested in several individuals, rather than in a single Chief.

The counter-proposal, however, had the effect of joining the battle over equal versus proportional representation in a national legislature.

Progress was slow and small, representing agreements or concessions on secondary points. The large and small states evinced no signs of yielding on the big issues. Throughout the city, talk grew that the assemblage would break up without results.

Washington's daily appearance in the Chair helped keep the weary delegates at work and restrained excessive argumentation. The General took no direct part in the debates.

Even for Washington, however, the outlook grew bleaker; "I see no end of my staying here," he wrote.

Up to that time, the only major agreement approved by the delegates was that one house of any new Congress be elected by the state legislatures, and that the other house be chosen by popular vote.

Already, however, a suggestion had been put forward which held a yet unrecognized potential for breaking the deadlock. It proposed a Senate where each state would have one seat, and a House in which the number of representatives from any state would be proportional to its population. This legislative system was the idea of Roger Sherman, of Connecticut.

The proposal failed of approval when submitted, but apparently stayed in enough members' mind to count. At least some were probably aware by then of the conclusion Washington had arrived at: "To please all is impossible, and to attempt it would be vain. The only way, therefore, is . . . to form such a government as will bear the scrutinizing eye of criticism, and trust it to the good sense and patriotism of the people to carry it into effect." There was one faction persuaded that only the "better" or educated classes understood responsibility and qualified for the conduct of public affairs. Another loose alignment wanted any new government to be democratic, of course, but not "too

democratic." With a third group the conviction mounted that "the people" were being lost sight of too often while the main controversy kept centered on the rights of states. This emphasis finally overtaxed the patience of James Wilson, of Pennsylvania, leading advocate of a broad popular electoral base.

"Can we forget for whom we are forming a Government," he tartly inquired of the Convention on June 30. "Is it for *men,* or for the imaginary beings called *States*?"

On July 2 the Convention appointed a committee of 11 to study anew the Sherman suggestion. Vague stirrings in various delegations evidently raised hopes of a chance that the small-state bloc might prove willing to go along with proportional representation in the lower house in return for state equality in the upper chamber. Benjamin Franklin, a member of this study group, made able use of his skill for conciliation and persuasion as the proposal was twice reexplored. The result was a redefined draft of the Sherman plan, with added stipulations that representation in the lower house be on the basis of one member per 40,000 inhabitants and that this house be the originator of all tax and appropriation measures.

This "Great Compromise," reported to the Convention on July 5, came immediately under raking fire of the proponents of a strong federal government. It was hit as a surrender to "expediency," a bribe to less populated states to permit other delegates to get on with more essential business.

By July 16, however, the "Great Compromise" was accepted, although only at the cost of another compromise which was to prove incredibly expensive and ill-advised for the country in terms of blood, treasure, and moral repute for generations to come.

The trouble erupted over the branch of Congress elected by popular vote. Under the formula, representation was to be on the basis of one member per so many thousand "inhabitants" in a state. Inescapably, the question arose as to the status of Negro slaves in population counts for this purpose.

States whose populace included free Negroes but a small per capita ratio of slaves balked at allowing states with very large slave populations to enumerate the enslaved on the same footing as free inhabitants in any census for Congressional representation purposes.

It is a wry twist of history that the problem should haunt the convention. When Thomas Jefferson drew up the working draft of the Declaration of Independence, its proclaimed "unalienable right" of liberty was not restricted as to race. On the contrary, in the indictment of abuses by King George III was the charge that the monarch sought to perpetuate the slave trade and slavery in the Colonies for the purpose of weakening them. This passage, however, was stricken at the insistence of two states where slaves accounted for a third or more of their total population.

Slavery was also inextricably entangled in the thorny thicket of other major problems through which delegates sought to find a way. It bore on the questions of representation in one house of the national legislature, the per capita taxation so urgently needed, the dire economic plight of the country and, above all, the possibility of getting the several separate and independent states unified.

What resulted, to meet the over-all situation, was the so-called "three-fifths" compromise; in census tabulations five slaves were to be counted as equivalent to three free whites, both for direct tax purposes as well as for determining representation in one house of Congress.

While agreeing to this formula, most delegates apparently looked upon it as a stopgap until a new national government was politically and economically stable enough to arrive at a resolute settlement. This view is reflected in the resolution put through which would enable Congress to legislate against slave trade in 20 years. It also limited importation of additional slaves to the two states still condoning the trade and made such imports subject to an entry tax to discourage further interim traffic.

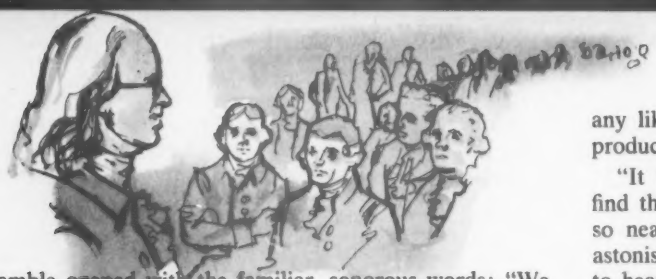
Once the "three-fifths" concession had carried, a spirit of reconciliation began to assert itself gradually. By July 26, delegates were so gratified over the constructive progress made that they created a Committee of Detail to digest and correlate the resolutions approved, then reduce them in orderly writing to a tentative draft of the Constitution. The Convention then adjourned until August 6.

The document presented on that date contained a variety of suprises. It embodied not only the sense of resolutions formally adopted, but also provisions from several plans submitted early in the Convention, plus some ideas from recommendations made six years back for bolstering the old Confederation.

For many delegates the draft's introduction, or preamble, held a reminder of previous contention. It read: "We the people of the State of New Hampshire," and then proceeded to name the other 12 of the former Colonies in the geographical order from north to south. Delegates with the honest conviction that the sovereign states were the all-essential components of any new government considered the interjection of "the people" a needlessly irritating reference to the source from which state sovereignty stemmed. Other delegates who had championed the doctrine of a national government, representative of all the people, were annoyed to have that representation compartmentalized in terms of the people of the enumerated states.

The Convention began the painstaking business of going over the tentative draft line by line and occasionally word by word, deciding what to retain, what to reject, what to amend, and what to add. This process consumed well over a month. As the work neared completion, a "Committee on Style" was given the task on September 8 of putting the reworked preliminary draft into polished English and making whatever changes deemed desirable.

The Committee delivered its ably rewritten document to the Convention on September 13 and now the Pre-



amble opened with the familiar, sonorous words: "We the people of the United States . . ." Besides the preamble, the original document contained seven Articles, or subdivisions, and the changes the Convention ordered in its language make a negligible list. (The complaint that its drafters had failed to include a Bill of Rights was obviated by the first U. S. Congress).

Given more opportunity to study the text, a number of delegates had changes of heart about how acceptable it was for them. There was a sizeable segment gratified over most of the provisions but with various reservations as to the remainder. There was a second grouping, happy about the equivalent of half of the document, but disappointed in different degrees over everything else. There was a third camp, advocates of a stronger national government, to which the draft was "awful," an abomination.

The Convention echoed to the last big tumult of contradictory pronouncements. The proposed Constitution offered a plan certain to lead to rule by a tyrannical aristocracy. It was prejudicial to persons of property. Nay, it favored the monied and elite classes to the detriment of the common people. This group of states would benefit most. On the contrary, another group would. And so words flew.

Saturday, September 15, brought the showdown session. It lasted seven hours without any of the normal breaks for recess, food, or tea. At length a resolution for dissolving the assemblage on the ground a Second Convention must be called was defeated without a dissenting vote. Then the question was put for accepting the Constitution, as amended. It passed unanimously. The task was completed.

September 17 brought the last symbolic scene in the protracted drama on which so much hinged. Franklin, with his instinct for historic moments, at the outset preempted the center of the stage. The lines he addressed to the assemblage had been shrewdly reasoned out in advance; his objective was to have events end with an eloquent show of harmony.

Disarmingly, he began by saying there were parts of the Constitution he could not then endorse, then he added: "but I am not sure I shall never approve of them." He drew on his long lifetime to discourse on how often better information leads men to discard biased original opinions for judgments of more rational and defensible character.

"In these sentiments, Sir," he went on, "I agree to this Constitution with all its faults, if there are such . . ." He brushed aside conjecture that another Convention could produce a better document. Any assemblage such as their own present one, Poor Richard mused, contained men of recognized wisdom and talent but divergencies were bound to arise. He questioned whether any like group would be able to arrive at "a perfect production" in plans.

"It therefore astonishes me, Sir," he declared, "to find this (Convention-elaborated) system approaching so near to perfection as it does; and I think it will astonish our enemies who are waiting with confidence to hear that our councils are confounded like those of the Builders of Babel . . .

"Thus I consent, Sir, to this Constitution because I expect no better, and I am not sure, that it is not the best. The opinions I have had of its errors, I sacrifice to the public good."

A few of the delegates still nourishing scruples took the floor to endorse Franklin's attitude. Even Alexander Hamilton, vigorous exponent of a far more centralized national government than the Constitution envisioned, spoke up in behalf of its approval. Soon the solemn moment was at hand. Delegates representing a dozen states filed to the engrossed document and put their signatures on the parchment. "Unanimous assent," Washington noted with satisfaction in his diary, and that evening the General went into seclusion "to meditate on the momentous work which had been executed."

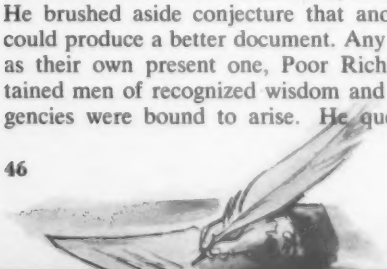
Meanwhile, the copy of the instrument, accompanied by a commendatory letter from the General, had been dispatched to the old Congress of the Confederation, then meeting in New York.

The proposed Constitution met a mixed reception there. After a few days of debate, Congress timidly avoided committing itself pro or con on the document and voted September 28 to have copies sent to the various states for the consideration of state conventions chosen by popular vote.

Delaware was the first state to ratify, December 7, 1787, followed by Pennsylvania and New Jersey. Nine states were required to establish the Constitution as the new law of the land, and the ninth to ratify was New Hampshire on June 21, 1788. With the necessary nine states in the fold, the first presidential elections were set for the coming January, and on the first Wednesday in March the new Government would take over.

This great charter for a free government by laws, not capricious men, is now almost three-quarters of the way through its second century. These additional years have brought even more formidable tests, but the men at Philadelphia in 1787 who hoped to "build for the ages" possessed a genius for anticipating the demands of the future far beyond their highest expectations. The Constitution they framed is still a living "most remarkable work," with a well demonstrated capacity for coping with the multifarious affairs of the most explosive transformation of society history has yet witnessed.

"We the people" are now some 60 times more numerous than in 1787. The "more perfect Union" of 13 states has grown to embrace 50, and "We the people" have achieved that under the aegis of the Constitution we swear to uphold and defend against all enemies, foreign or domestic.



Meet the JETSTAR

THE AIR FORCE this fall will put into service a new jet utility transport—a fast, high-flying aircraft developed to replace out-of-date, piston-powered planes.

What is the plane? What is its background?

It is the C-140 *Jetstar,* a compact, high-performance, four-turbojet-engine utility transport, developed at the request of the Air Force. The Air Force sought, in its first letter in 1956 to aircraft manufacturers, a jet utility transport to replace the 10-to-25-year-old piston engine airplanes that are physically incapable of providing the speed and altitude performance required today.

It asked the aircraft industry to design and build, at industry expense for "off-the-shelf" procurement, a compact jet that would be economical to operate, yet would have speed and performance comparable to the huge jet transports. The *Jetstar,* Lockheed's entry, was selected in Air Force competition.

Now in production at Lockheed's Marietta, Ga., plant, the plane is comparable in size to the C-47. It is 60.5 feet long, has a wing span of 53.7 feet, and a gross take-off weight of 40,921 pounds.

Today, Air Force crews are taking indoctrination training at Marietta to familiarize themselves with the new aircraft. Military Air Transport Service Special Air Mission fleet, and the Air Force Communications Service will get the first C-140s.

The latter will use some of them—fitted with consoles and electronic equipment—as fast, high-flying laboratories to monitor navigational aids and to calibrate the Air Force's world-wide airways systems.

The MATS will use the 500-600-miles-per-hour jet to slash travel time and increase the effectiveness of personnel on high priority assignment. Because of its speed, the C-140 will have a lower operating cost per mile than the planes it is replacing.

It is suitable for high-priority cargo hauling, capable of airlifting 2,787 pounds normally, or up to 4,800 pounds at lower speed.

As a personnel carrier, it can transport 8 to 12 passengers and a crew of two. It can move a combination load of cargo and passengers.

The Air Force is also interested in the C-140 as an advanced systems trainer. Training stations can be installed in the aircraft, making it a flying classroom. It closely approaches the cruise speed and altitude of manned bombers of today. Use of this smaller aircraft as a trainer would minimize costly post-graduate training in tactical aircraft.

Aside from missions for which it is being initially sought, the military C-140 *Jetstar* is designed for command mission support, which could speed command and staff personnel and equipment to missile sites, on inspection trips, and to other assignments.

The aircraft can be used as a universal test support aircraft, capable of service as a flying laboratory for research and development testing of new aircraft components, systems, and sub-systems under the most realistic flight conditions. Lockheed engineers say present piston-engine aircraft don't have the speed and altitude performance needed, while converted large combat jets are too costly to operate and lack adequate pressurized space.

The new utility jet can operate day and night over land or sea. It is an all-weather aircraft, possessing the navigation/communication instruments of the large jet transports.

Four Pratt and Whitney J6OP-5 jet engines power the C-140. For safety and quietness, the engines are mounted to the C-140 rear fuselage in a design now being adopted by manufacturers of other new jets.

Normal flights of the Air Force's new utility jet will be conducted at altitudes between 35,000 and 45,000 feet. Range is 2,200 statute miles, providing normal military reserves.

The compact jet doesn't require long runways. At maximum take-off weight of 40,921 pounds, it can be airborne after a ground roll of only 3,780 feet, and over a 50-foot obstacle in 5,500 feet. At maximum landing weight of 30,000 pounds, the ground roll is only 2,100 feet.

The Warner Robins Air Materiel Area, Robins Air Force Base, Ga., has been assigned responsibility for logistics support of this new Air Force jet.

TIPS ON TECHNOLOGY

A Stainless Memory

Hughes Aircraft announces development of a stainless steel memory drum, four inches in diameter, which stores 286,000 data bits for use in mobile electronic defense systems. One-seventh the area of the eight-inch aluminum drum used previously, the steel drum has double the packing density, is cheaper to produce, extremely stable, and less susceptible to environmental changes.

Military Circuits Already Crowded

Air Force Systems Command has let a contract to Armour Research Foundation for technical support of a tri-service program to analyze possible mutual interference problems of military electronic devices. The Electromagnetic Compatibility Analysis Facility will check everything from walkie-talkies to the largest radar systems to locate frequency overlap and spurious radiation that might interfere with other systems.

No Grease, No Squeak

A greaseless bearing that will support a 100-pound load through a temperature range from 75 degrees F. to 2,200 degrees F. at speeds up to 65,000 revolutions per minute is the goal of research contracted for by AFSC's Aeronautical Systems Division at Wright-Patterson AFB. A continuation of a two-year-old program that has produced a gas-lubricated bearing already operated at temperatures up to 15,000 degrees, the contract calls for checking lubricating qualities of nitrogen, helium, argon, and carbon tetrafluoride.

Hot Stop Fibers

Aeronautical Systems Division's Materials Central at Wright-Patterson reports a promising new nylon-like fiber that withstands temperatures up to 550 degrees F. and still retains 85 percent of its strength. Called HT-1, the fiber developed by DuPont de Nemours has been under investigation since 1958. Capt. C. O. Little, Jr., project engineer, sees a use for it in fast-landing aircraft tires, and his office has tested the material in parachute canopies, particularly for drag 'chutes stowed near engines or where they may be subject to aerodynamic heating. The new material does not melt or fuse like nylon, nor does it char and burn like cotton. Instead, it carbonizes with filaments intact at nearly twice the melting temperature of nylon. It is immune to gamma radiation.

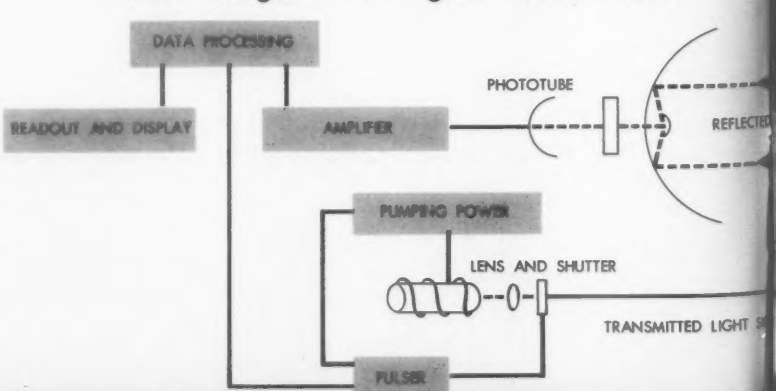
Turn Off Your Portable

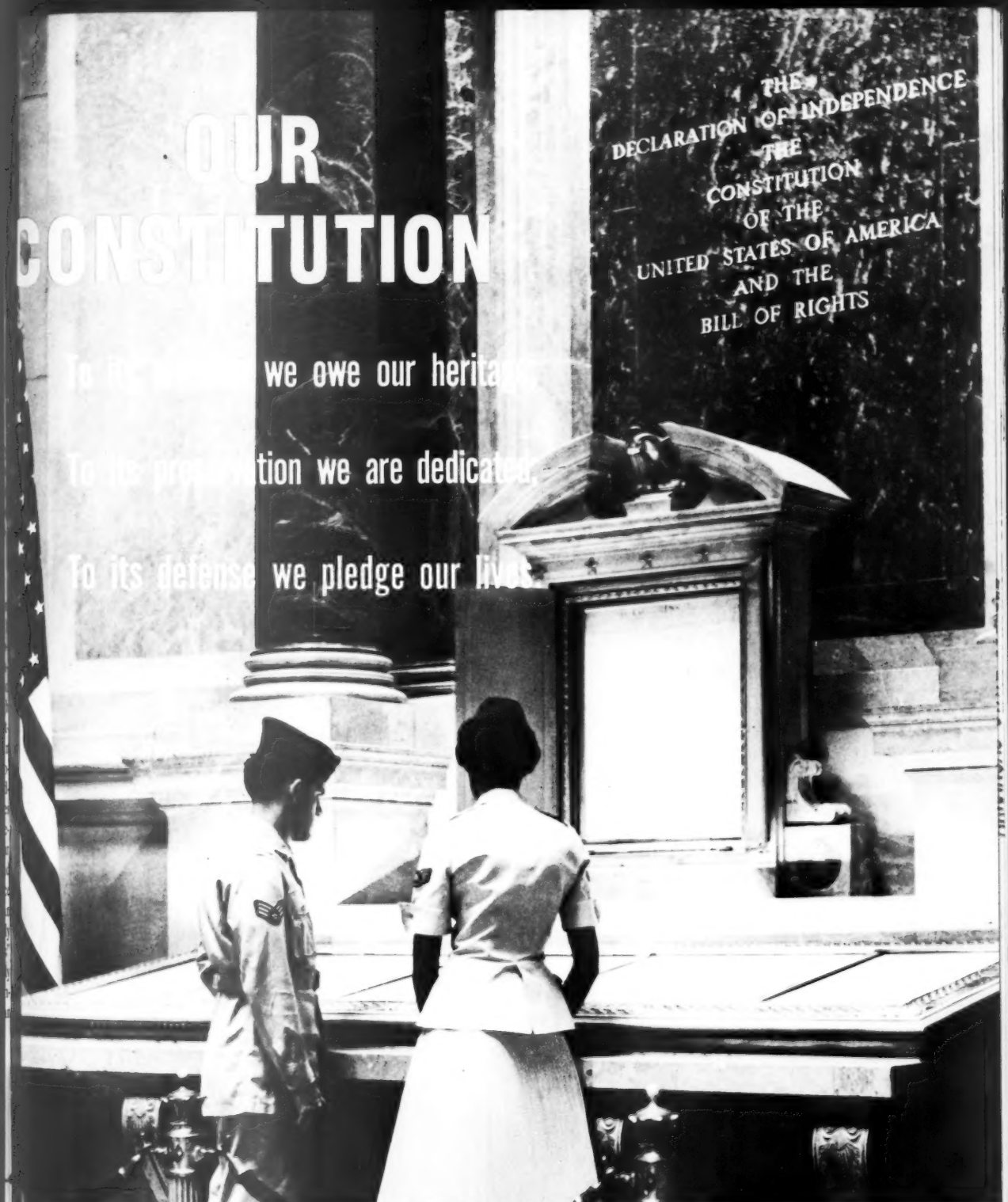
The Federal Aviation Agency has prohibited the use of portable FM radios in aircraft because the oscillators in these radios interfere with the aircraft's VHF radio navigation system.

Light That Communicates

Using a laser (light amplification by stimulated emission of radiation) generated lightbeam, Sperry Gyroscope plans development of a compact, light-weight, modulator to communicate information through space. The pencil-thin infrared lightbeam, a million times brighter than rays of the sun, will replace microwave radar beams in advanced guidance and control systems. Hughes Aircraft is also using laser to develop a similar system called Colidar (for Coherent Light Detection and Ranging) to replace radar for space and satellite use. The lightbeams can discriminate targets more accurately than microwave, radar "pictures" made by laser are exceptionally sharp, the systems are more compact, and demand less power than conventional microwave.

Block Diagram of Hughes Laser radar



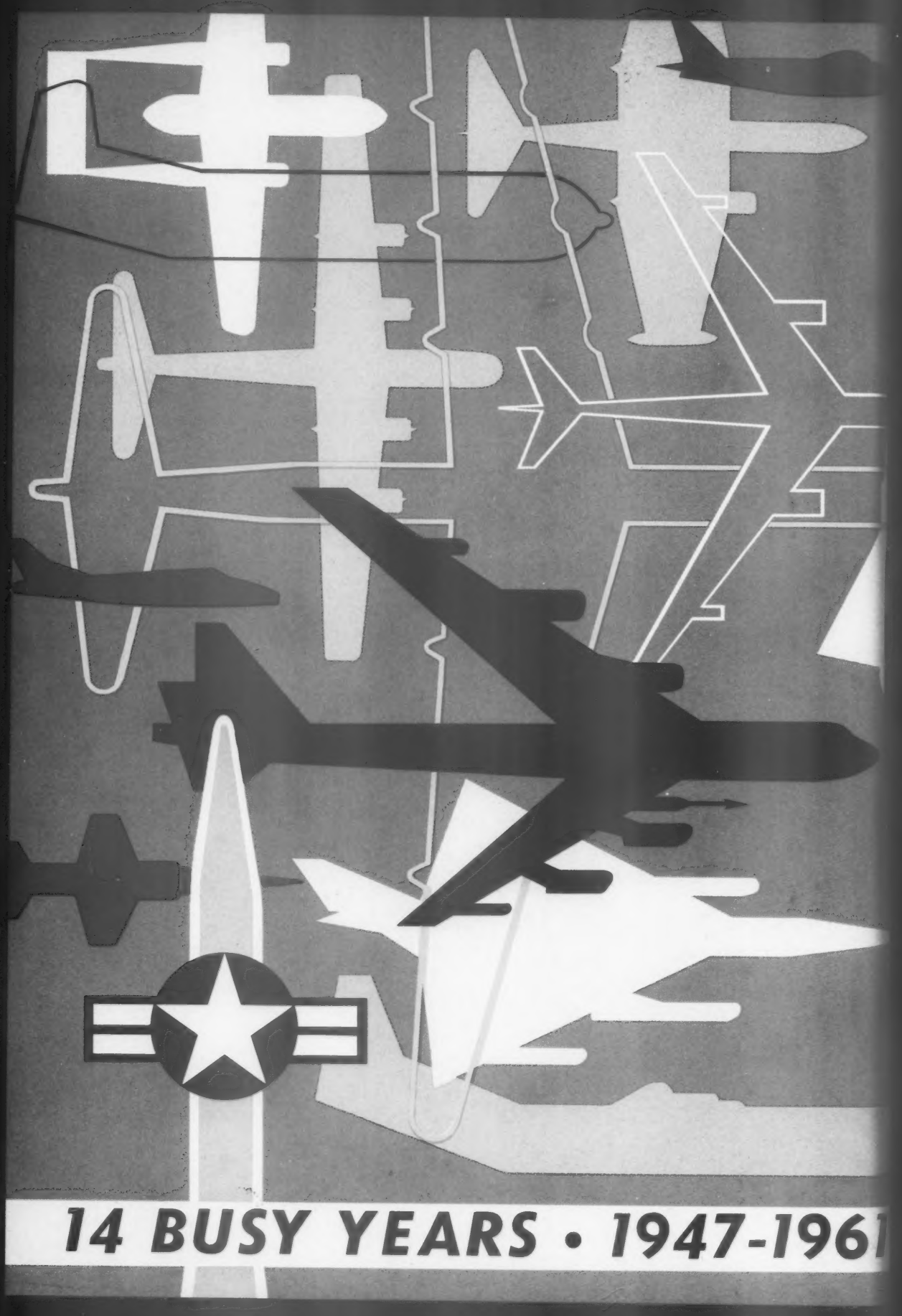


CONSTITUTION WEEK:

September 17-23

The Constitution, Bill of Rights, and Declaration of Independence, on display in the National Archives Building, Washington, D. C.

Photo by SSgt. Ted Gaidelis, staff photographer


14 BUSY YEARS • 1947-196